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The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE.

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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No. 2471.—Vol. LII.

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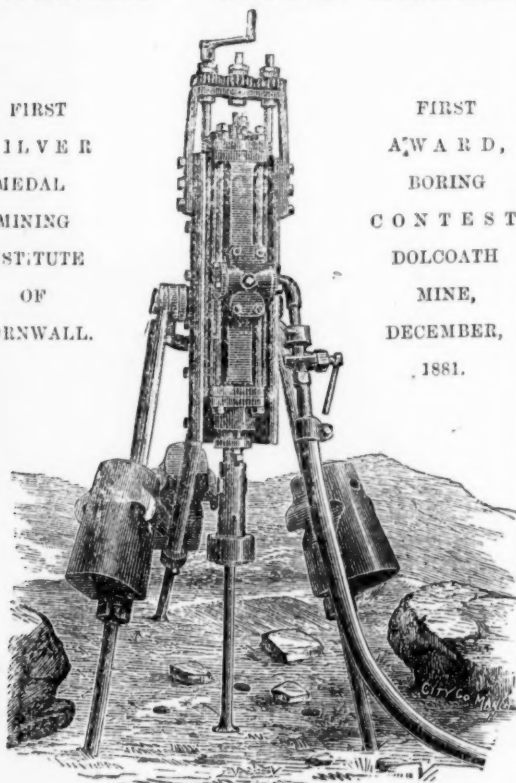
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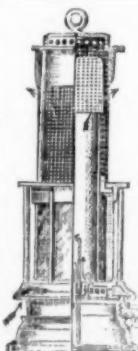
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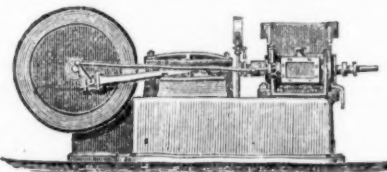
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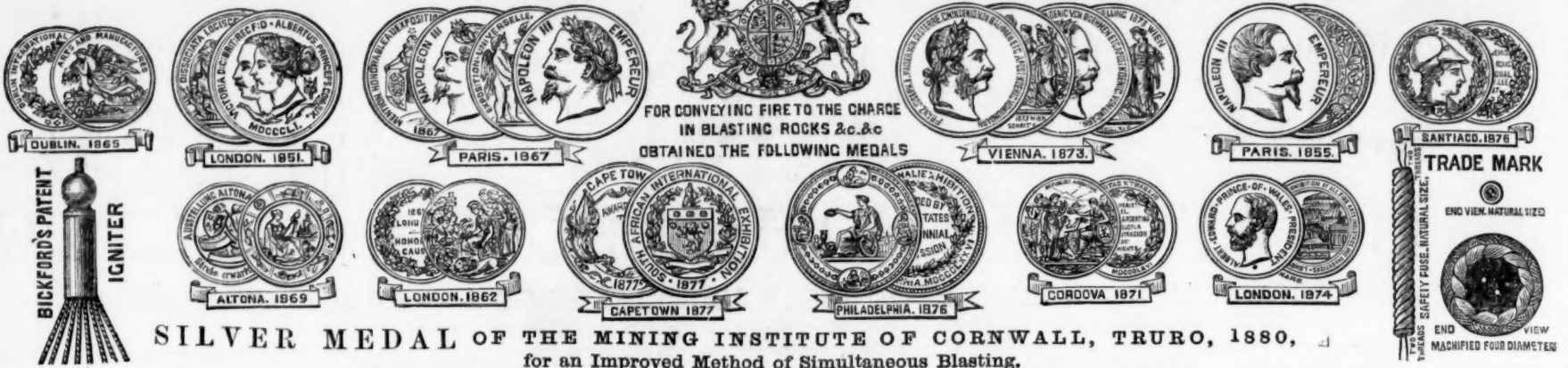
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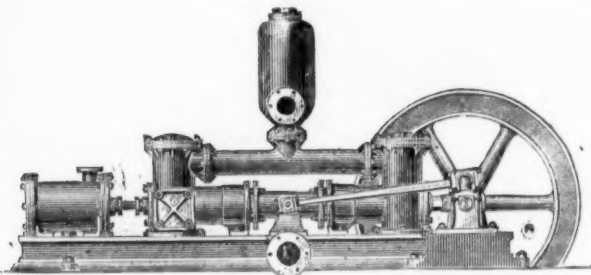
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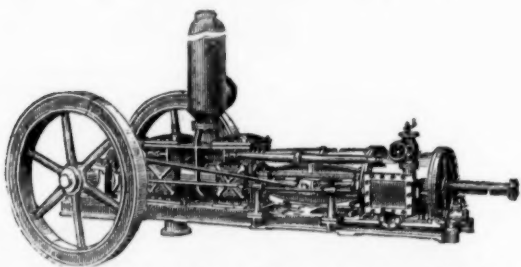


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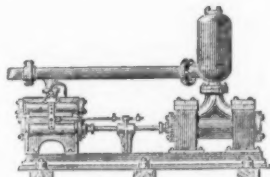
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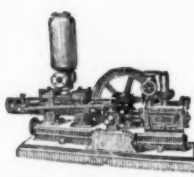
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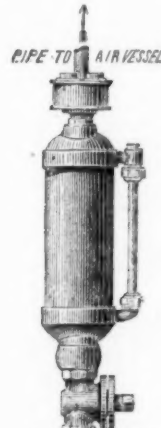
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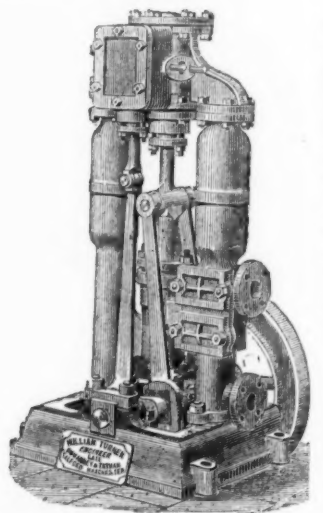
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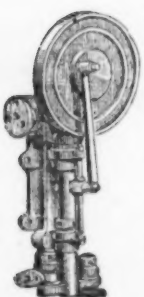
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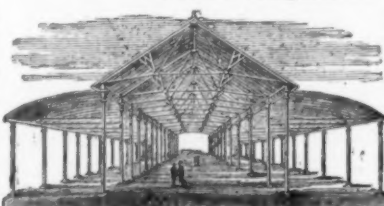
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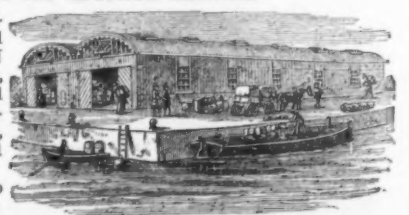
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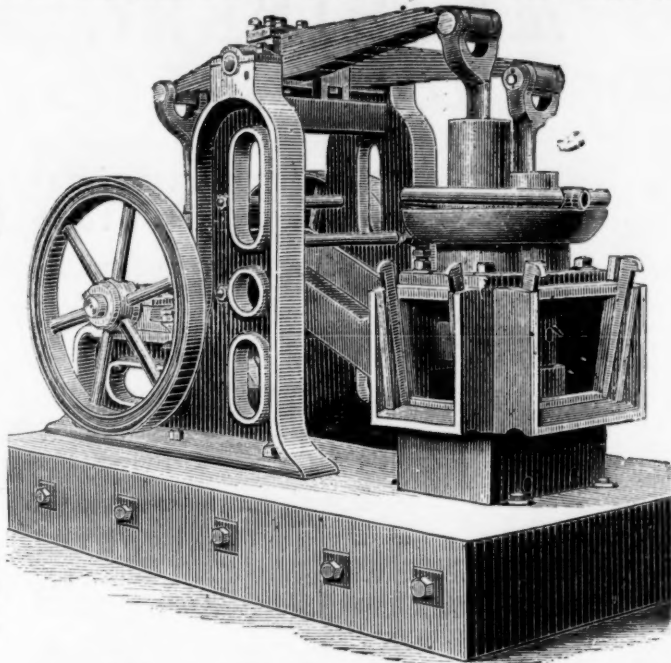
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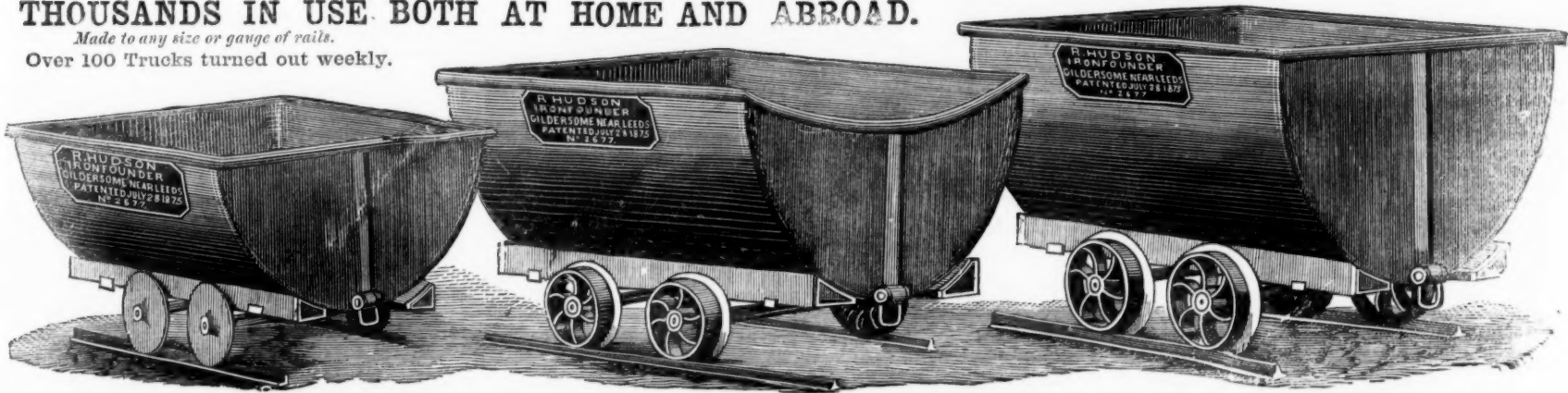
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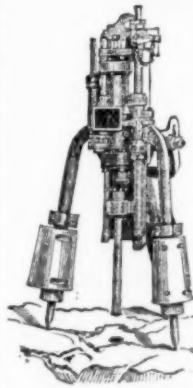
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APPLICATION.

FOREIGN MINING AND METALLURGY.

The Belgian iron trade appears to have slightly improved. The situation can scarcely be said to be brilliant at present; at the same time, the downward tendency in prices which had been noticed of late has received a check. Orders have come to hand from various sides, and as coal and coke still rules high, ironmasters have maintained prices with more firmness. Iron has been in somewhat more request, some fresh orders having come to hand. Among these new orders may be mentioned one from Australia for about 600 tons, and another from China for 500 tons. The Chinese order is expected to be followed by others of similar importance. Encouraging advices have also come to hand from Japan. Most of the blast furnaces are engaged for three months in advance; some of them have even work assured to them for six months in advance, and prices have naturally been sustained with some firmness in consequence. Iron has made 57. 4s. per ton, the market, at the same time, being characterised by a firmer tone. Plates have been in rather more demand, although some of the smaller works would probably be disposed to do business upon slightly lower terms. Contracts are about to be let for a small quantity of accessory *matériel* for the Belgian State Railways.

Floods which had prevailed round Paris having become less serious, the ironworks have resumed operations, and the demand is for the present exceeded by the production. Merchants' iron has made 77. 10s. per ton. In the Nord orders have been a little less abundant, especially as regards plates; the production has, at the same time, been considerably increased. As an illustration of the extension of the production we may state that in the Manhenge district the make was two years since 2000 tons per month, while now it amounts to at least 5000 tons per month. The Orleans Railway Company has given out some orders for rolling-stock. These orders comprise altogether 900 trucks, and were divided between MM. Desonches and David, MM. Renard and Réchade, and the Dyle-Bacalan Company. In the German iron trade the prevailing tone has been one of hesitation. There has been no fresh reduction in quotations, but business has been scarce, and consumers appear to be ordering as little as possible. The reserve of buyers is, no doubt, attributable to the discouraging news received of late from Great Britain and the United States. The German steelworks continue well employed; at the same time, existing orders are being worked out. The production of iron minerals in Germany and in the Luxembourg in 1881 is officially returned at 7,573,000 tons, as compared with 7,238,000 tons in 1880; the production of pig in 1881 was 2,914,000 tons, as compared with 2,279,000 tons in 1880; the production of iron was 1,412,000 tons, as compared with 1,338,000 tons in 1881; and the production of rolled steel was 897,000 tons, as compared with 688,000 tons in 1880.

The Belgian coal trade has maintained the good tone which has been remarked for several weeks past, deliveries having continued active; on all sides coalowners appear to be satisfied with the situation. The weather has still continued mild, upon the whole, in Belgium, although there have been a few days of cold. Good industrial coal has been in fair demand. In the Couchant de Mons prices have ruled firm. The conditions of the German coal trade also leaves little to be complained of, although some qualities have been in a rather less active demand. This remark applies more particularly to household coal. Business has exhibited less strength in Westphalia than in Silesia and the Sarrebruck district. It appears from official returns that the aggregate production of coal in the German Empire in 1881 was 48,688,000 tons, as compared with 46,973,000 tons in 1880. Lignites were produced in 1881 to the extent of 12,852,000 tons, as compared with 12,144,000 tons in 1880. It will be seen that the production of coal in Germany increased last year to the extent of 1,715,000 tons; that of lignite also expanded to the extent of 708,000 tons. The production of coal in the Sarrebruck district in November was 465,762 tons.

THE LIME CARTRIDGE METHOD OF GETTING COAL.

In consequence of the attention directed at the beginning of the year to Messrs. Smith and Moore's system of blasting, which was being tried at the Shipley Colliery, near Derby, the Council of the Mining Institute of Scotland appointed Messrs. Barroman and Hastie to visit that colliery, and as the result the patentees were invited to send men and material to make trials of their system in the different seams of the Hamilton district, but no notice was taken of the deputation. Since then so many favourable reports have appeared in the *Mining Journal* and daily papers that Mr. Watson, of Earnock, arranged with the patentees to try their method in the ell coal seam of his Earnock Colliery. The result was communicated at the monthly meeting of the Institute on Dec. 14, when Mr. Gilchrist, the secretary, gave the trial, the chair being occupied by the President, Mr. Ralph Moore, H.M. Inspector of Mines. The patentees' agent, Mr. Oliver, and two men arrived on Nov. 23, and were at once conducted below ground to a place where preparations had been made for the trials. It was at a part of the mine where they had been stooping for nearly three months. The place selected for the first trial was the first lift on the side of a stoop next to a large barrier of coal that they were leaving in for a special purpose. It was holed 5½ ft. for 13 ft. along the side of the stoop. Mr. Oliver expressed himself highly satisfied with the place, and at once started his men to drill three holes, and afterwards charged them with lime, putting 29 in. into each hole, and stemmed the remaining space in the usual way. As the trial was only considered a preliminary one he took no note of the time it took to charge the holes or how long they waited before the sprags were withdrawn, but when the sprags were taken out the result was that only a piece of coal came down at the corner of the stoop weighing 30 cwt., the second and third holes never having been broken.

The results much disappointed Mr. Gilchrist, but Mr. Oliver was satisfied, and by his desire a number of gentlemen were invited to witness the next day's trial. This was conducted in a different part of the mine, in a "splitting place," through a stoop already formed. coal was very hard and ill to get; the place was 13 ft. 6 in. wide in the holing and 12 ft. 6 in. wide at the roof. The coal was 7 ft. thick, 5 ft. of which was brought down in the first working and the remaining 2 ft. was lifted as the road advanced. The place was holed 6 ft. deep, and had been standing holed for two days. Mr. Oliver wanted it cut on one side, so as to get an open end, so the collier who prepared the place cut or "shored" it in for 6 ft. that morning. Mr. Oliver's men drilled three holes in this place, and having charged them with lime, it took them two minutes to charge the three holes with water. Immediately they heard the coal begin to crack and craze as if it were going to tumble over, but it was in no way dangerous to remain beside it. The sprags were drawn 50 minutes after the holes were charged with water, and only about 30 cwt. of coal came down; 1 ft. of the hole next the shearing was left on, and 2 ft. of the second hole, the third never having been touched. When the coal came down the lime that was in the first hole had not apparently received enough of water, and the result was that the lime became a very fine impalpable dust, and filled the whole place. It was worse than powder smoke; in fact, it was as bad as the gases given off when a charge of dynamite is fired.

So dissatisfied was Mr. Oliver with the day's results that it was arranged to make others the following day, and Mr. Gilchrist got a



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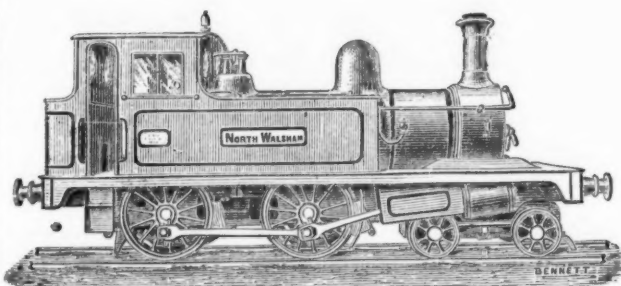
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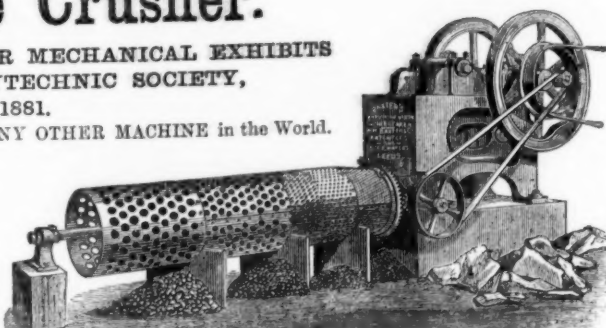
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The Bold Venture Lime and Stone Co., Peak Forest,
Messrs. W. H. Baxter and Co., June 8, 1881.
GENTLEMEN,—We have the pleasure to inform you that the 20 by 9 Stone Breaker supplied by you is now working to our entire satisfaction, and we are now able to fulfil our contract with ease, which we had much difficulty in doing before with the Blake Machine. It takes less power and turns out considerably more stone.
Yours truly,

BOLD VENTURE LIME AND STONE COMPANY



GUARANTEED NO INFRINGEMENT OF ANY OTHER PATENT.

AWARDED THE ROYAL MANCHESTER, LIVERPOOL, AND NORTH
LANCASHIRE AGRICULTURAL SOCIETY'S SILVER MEDAL,
8TH OF SEPTEMBER, 1882.

FOR FULL PARTICULARS ADDRESS TO THE PATENTEEES AND SOLE MAKERS,

W. H. BAXTER & CO., ALBION STREET, LEEDS.

SOLE AGENTS FOR LONDON AND DISTRICT—

THOMAS GREEN AND SON (LIMITED), ENGINEERS, BLACKFRIARS ROAD, LONDON, S.E.

TUBES

SILVER MEDAL (HIGHEST AWARD) MELBOURNE, 1881.
JOHN SPENCER,
Tube Works, West Bromwich, and 3, Queen Street Place, LONDON, E.C.
FIRST PRIZE, SYDNEY, 1880.
TUBES AND FITTINGS for Gas, Steam, and Water; Galvanised, Enamelled, and Hydraulic Tubes; Boiler Tubes and Fittings; Gas Fitters' Tools; Brass Cocks, &c.
ANTI-CORRODOR TUBES AND FITTINGS COATED BY BARFF'S RUSTLESS PROCESS.

place prepared at the stoops where the first trial was made. In order to make the trial successful he also got a longer drill made to suit their machine so as to enable them to drill deeper holes, and thereby get more lime into each hole. After charging the holes and pumping in water the sprags were drawn, but he was sorry to say no coal came down. The corner was rent away from the roof, and one of the men got a wedge and wedged it off; 1 ft. of the first hole was left on and 3 ft. of the second, while the third and fourth holes did nothing. Further comment was, he thought, unnecessary. The coal was, in Mr. Gilchrist's opinion, simply far too strong for the lime, that there was no loss of power from leakage, and that the men themselves admitted the coal was too strong. All the gentlemen who had witnessed the trial concurred in saying that the new method would

not have done in the seams of coal with which they were connected; several said it would not have done so well, and one stated that it might have done better, but he had no great hopes of it being successful.

HOLLOWAY'S PILLS.—Sudden changes, frequent fogs, and pervading dampness sorely impede the vital functions, and conduce to ill health. The remedy for such disorders lies in some purifying medicine, like these pills, which is competent to grapple successfully with the mischief at its source, and stamp it out, without fretting the nerves or weakening the system. Holloway's pills extract from the blood all noxious matter, regulate the action of every disordered tract from the blood all noxious matter, regulate the action of every disordered organ, stimulate liver and kidneys, and relax the bowels. In curing chest complaints these pills are remarkably effective, especially when aided by a free local application of the ointment. This double treatment will ensure a certain, steady, and beneficial progress, and sound health will soon be re-established.

Original Correspondence.

MINING IN NEW SOUTH WALES.

SIR,—The following extract from an article by our Under-Secretary for Mines here will give your readers a very fair idea (in a condensed form) of three of our great mineral products—copper, tin, and iron—and the article is all the more to be depended on, inasmuch as Mr. Wood is also an experienced miner, and knows what he is writing about.

COPPER.—So far as is known our copper lodes were first opened in 1858. Since then we have exported 43,929 tons of copper ingots, and 3205 tons of ore and regulus. Total value to the end of 1881, 3,213,587. The number of men engaged in and about our copper mines in 1881 was 1177. Our known cupriferous formations cover an area equal to about 4,296,320 acres; but there are enormous tracts of country the exploration of which will increase the area. Some of the lodes at present in work are very large, and the ores yield a high percentage of copper; but the low price of copper, coupled with the difficulties of transit from the mines to the port, has had the effect of seriously retarding the development of our copper lodes. The most important copper mine in the colony at the present time is the Great Cobar Mine, and it is the most distant from the seaboard, being 497 miles west of Sydney. The quantity of ore smelted at this mine is 69,118 tons, producing 9182 tons of fine copper. In 1881, 21,552 tons of ore were smelted, producing 2568 tons of copper. The lode occurs in Silurian slates; it varies in width up to 100 feet. On the surface appear the outcrops of two adjacent parallel lodes; it is believed, however, that all three form one lode, being only separated by pieces of ground known to miners as "horses." The ores consist of carbonates, metallic copper in films, red oxide, and grey and yellow sulphides. The oxidised ores are available in considerable quantity. At Nymagee, in the Cobar district, a large and valuable copper lode is now being extensively worked. It traverses Silurian sandy slate formation, striking N. 17° 30' W., and is nearly vertical. The ores are remarkably free from injurious minerals. In the same district the Girilambone Copper Mine, situated 60 miles east of Cobar, has been opened. This mine is only 1½ mile from the proposed line of railway to Bourke. About 90 miles south of Cobar is the Mount Hope Copper Mine. The main lode is in ferruginous sandstones, and is 24 ft. wide on the surface; its strike is N. 7° 30' E.

Besides copper gold and tin have been discovered in the country lying between the Lachlan and Bogan rivers, which will doubtless become a most important mining district. Copper lodes have been opened, and more or less worked in years past at Peelwood, Cow Flat, Wiseman's Creek, Thompson's Creek, Carangara, Ophir, Cadia, Canoblas, Carcoar, Icely, Molong, Goodrich, Balara, Snowball, Frogmore, and near Goulburn; the existence of other lodes is known of in the Wellington, Murrumbidgee, Bombala, Braidwood, Grafton, and Albert districts. Gold, silver, lead, zinc, and bismuth are sometimes found in the copper ores. During the past year (1881) several rich copper lodes have been discovered in the vicinity of Blayney, and close to the Great Western railway line. Considering the extent of our copper-bearing country the progress hitherto made in copper mining has not been as great as could have been desired. The want of success which has attended the attempts to develop our copper lodes has, it is feared, in many cases been due to want of skill on the part of those engaged in the attempt; but, as our experience increases, and with the example of some of our larger and better managed copper mines to guide us, we may hope to improve upon the past. The success which has attended the operations at some of these mines during the past two years has evidently had the effect of directing more attention to this branch of mining; and, if the new ventures be conducted with skill and judgment, we may reasonably expect that our output will be commensurate with the extent and value of our deposits, and as our railway system extends into the interior lodes which have hitherto been neglected on account of the difficulties and expense of bringing the ore or metal to the seaboard will be extensively and profitably worked.

TIN. though discovered by the late Rev. W. B. Clarke as early as 1853, was not worked till 1872. Since that date we have exported 48,055 tons of fine tin in ingots, in addition to 14,212 tons of ore. Total value, 4,339,577. The number of miners employed in our tin mines in 1881 is estimated at 4530; of these 3000 were Chinese. In addition to the alluvial deposits of tin ore there are numerous valuable lodes; but the latter have not yet been worked to any extent on account of the capital and skill necessary for their proper development. The alluvial deposits first worked were found in beds of existing creeks, but more recently tin ore has been found in large quantities in beds of old rivers or creeks at depths varying from a few feet to 150 feet. In some cases these deposits are covered by basalt. The extent so far as known of our stanniferous deposits is at least 5,440,000 acres; but it will probably be found more extensive than this, as Mr. H. Y. L. Brown, geological surveyor, has recently discovered tin ore at the Granite Diggings, in the north-western portion of the colony. The tin-bearing localities hitherto worked are situated about the high lands of the Great Dividing Range in the northern and southern districts. Several lodes of cassiterite have been opened, as at Tingha, Elsmore, Newstead, the Gulf, Jingellic, &c.; they occur chiefly in eruptive and micaceous granites. But nearly all the ore hitherto raised is stream tin obtained from the Tertiary and Quaternary drifts, where these are composed of the detritus from the stanniferous granites. Gold, wolfram, metallic bismuth, and carbonate and sulphide of bismuth are occasionally found with the tin ore; sulphide of tin rarely. The concretionary variety of tin oxide called "Toad's-eye" tin occurs in the Pliocene gold drifts at Grenfell.

IRON.—The existence of extensive deposits of rich iron ores at Wallerawang, Lithgow, Mittagong, Mount Lambie, Berrima, Illawarra, and in various other parts of the colony, has been demonstrated—in many instances in the vicinity of coal and lime in abundance; but owing to the heavy cost of erecting smelting and other works, and the difficulty of securing the necessary skilled labour, very little has yet been done towards developing this important source of wealth. In fact, with the exception of the Fitzroy Works at Mittagong, which have been abandoned for some time past, the only works in the colony are those of the Eskbank Iron Company at Lithgow Valley, which were originated in 1875. These works consist of furnace, foundry, and forge, and rolling mills; the two branches are connected by a horse tramway. Most of the plant, including a 24-ton fly-wheel, was made on the ground. The blast furnace is capable of producing 100 tons of grey, or 115 tons of white iron per week. Both pig and malleable iron are made, and large quantities of rails for tramways have been rolled. Upon this company's property are iron ore, coal, fire-clay, and moulders' sand. During 1881 the Eskbank Iron Company made pig-iron to the value 10,950; bar, angle, and rail iron to the value of 31,086, and castings, &c., to the value of 5777. During the year the blast furnace was worked only five months and 17 days.

Irregular masses and veins of magnetite with garnet ironstone and some lodes of brown hematite occur in the Devonian beds near Wallerawang, while interbedded with the coal measures which extend from Wallerawang to Bowenfels are several thin beds of rich clay-band iron ore—a variety of hematite. According to analyses made by Professor Liversidge, the magnetite ore averages 40.87 per cent. of metallic iron, the garnet ironstone 21 per cent. of iron, the brown hematite 37.84 to 51.52 per cent. of iron, the clay bands 49.28 to 56 per cent. of iron. The extensive deposit of brown hematite at Nattai is in spring deposit formed at the junction of the Hawkesbury and Wianamatta formations. Iron ore consisting of red and brown hematite occurs in the Hawkesbury rocks at Mount Clarence in considerable quantity. A sample analysed by Mr. C. Watt, Government Analyst, contained 55 per cent. of metallic iron. This ore is generally very siliceous. The large deposits of iron ore near Blayney are now quarried for the Eskbank Smelting Works.

I happen to know the Goodrich well, and at the present time they are crushing granite apparently as barren as road metal, and getting 6 dwts. of free gold per ton, whilst the main lode (60 ft. thick) of quartz and granite mixed is blended copper and gold varying greatly in quality from 3 per cent. even up to 20 per cent. (in the bunches

of ore), and from 3 dwts. up to 12 ozs. of gold per ton. I also know the Mount Clarence iron lode which is now being opened up. M. Turnbull, jun., of Hay, to supply the Eskbank Ironworks (about six miles off at the foot of the mountain), and 15s. per ton delivered is offered for it, which will leave about 6s. per ton profit.

TIN.—Most of the known surface deposits are nearly worked out, but on sinking through the overlying basalt (from 60 to 150 ft.) richer leads are now being found, and the alluvial tin industry is in its infancy as yet; amongst other lucky holders of tin land is B. O. Holtermann, who held the wonderfully rich gold mine at Hawkins Hill in the furor of 1870—"Luck is all."

Sydney, Nov.

MINERAL RESOURCES OF COLORADO.

SIR,—After making all allowance for the naturally sanguine and flattering estimates of the progress of Colorado which are too plentifully dinned into the ears of the visitor, there can, I think, be little doubt that it continues to be rapid and great. A local paper, in a recent "editorial," coolly observes that "not much noise has been made about the matter, but Colorado has made unprecedented progress in the development of her mineral wealth during the past year." I do not well know what the local scribe means by "not much noise," for my experience of Colorado is that a very great deal of noise is made as a general rule about the smallest and scantiest materials. After all deductions, however, in consideration of the boastful and exaggerating propensities of some of the people one meets in these parts, enough remains of a solid kernel of real advance in prosperity and development to satisfy even exacting critics. During the past year Colorado has been going ahead in a manner and to an extent that ought to satisfy all reasonable expectations. From all I can learn the actual output of mineral wealth will exceed this year that of last to the value of from \$4,000,000 to \$5,000,000, so that the State is still at the head of mineral-producing States. The variety of the elements contributing to the prosperity of the State are to be reckoned among its greatest advantages. Its wealth is being added to by the operations of the works of the Colorado Iron Company and Denver Rolling Mills, and the plant of the Colorado Coal and Iron Company. In addition to the more famous gold and silver products of the State its iron output during the year 1882 will be enough of itself to attract the attention of capitalists from other parts. The coal and coke interests of the State have also made distinct progress, and bid fair to surpass the calculations of the most sanguine. The agricultural interests of Colorado are going rapidly ahead, and this is evidence of abundance on every side, proving that the prosperity of the people of the State is making progress at a rate and to an extent which is gratifying in the extreme, though it may be not quite so unprecedented as it pleases the local chroniclers and flatterers to aver.

Among the employers of labour and dispensers of capital in the State a prominent place has now been taken by what is known in these parts as "the English Company." The English Company, it may be necessary to explain, is what we know in England as the Robinson and Donaldson Consolidated Mining Company (Limited), which has entered recently upon an extension of what promises to prove a very profitable sphere of operations in the properties of which it is the fortunate owner. Under the enlightened management which this company has happily secured, the efforts after economical operations are unremitting, and are certain to prove successful. In illustration, I need only refer to the contract recently entered into with the well-known firm of Messrs. Fraser and Chalmers, of Chicago, for building what when finished will be one of the most complete mills in the United States. The capacity of this new mill will enable 200 tons of ore per day to be treated without the loss of any residuum worth mention. The mill will be driven by 400-horse (water) power by the use of the well-known Turbine wheels. When finished the tramways of the company will reach from the Champion Mine to the ore dumps at the mill, and then there will be another tramway connecting the Donaldson Mine with the same point. The capacity for carrying ore of each of these tramways will enable it to convey 150 tons every 24 hours. A novel and striking feature will be the lighting up of the works, mines, and trams included by electricity, which will be done without extra cost, and will present an altogether new element in the working of gold and silver mines in Colorado. The company has been wisely guided in securing the services of Messrs. Fraser and Chalmers—a firm whose extensive operations and wide experience in milling and mining machinery are not confined to one State; for they are well known throughout California, Utah, and other ore-producing regions, as well as in Colorado. Indeed their reputation may be safely said to extend throughout South as well as North America, and their work will be found everywhere equal to their fame. One of the recent novelties introduced by them into this district is what are known as the Frue Vanner for the treatment of ores. These machines have lately been set in the Star Mill for the Robinson and Donaldson Company, and are working with remarkably satisfactory results. It has been demonstrated by various test assays that only 28 cents per ton remain in the waste rock of the ores from the mines of the company which are treated by this process. Although these Frue Vanner machines have been in use for years in California they are neither numerous nor familiar as yet in Colorado mining. As they are more and more employed, however, in the treatment of ores they are certain to bring about a great and profitable change, and it is to the credit of the English Company that it has set the example in the Idaho district in employing a process and machinery which are certain to be regarded ere long as of universal interest to the general public, seeing that the results are so salutary and satisfactory. The supply of ore from the company's mines is ample to keep these machines in constant operation. In the Donaldson Mine alone some 12,000 tons have been opened up, and are now being stoped and prepared for the mill. The ore is running now as high as 10 tons per fathom in some of the levels, and in others the smelting ore shipped to Argo shows that the ground is worth some \$300 per fathom. The engine-shaft of the Champion Mine is being enlarged, so that it shall have a capacity for an output of 200 tons per day. The greater portion of Bellevue Mountain is the property of the company, and with a lode of from 4 to 15 ft. wide, worked as it now is to a depth of 600 ft., it is morally certain that in a very short time this company will open out one of the most valuable and extensive mines in Colorado. The Champion Mine ores are both rich and massive, running from \$100 to \$600 per ton. When the tramways for the transportation of the ore are in operation, and the improved methods of mining and milling adopted, or to be adopted, are at full work, the profits realised will exceed the proportion heretofore attained many times over.

A visit to the Champion Mine by anyone who comes to Colorado will well repay the labour and trouble necessary to see the operations on the actual spot. The Mine offers to view a gratifying show of mineral wealth which, as it is gradually realised and turned to account, must abundantly gratify the hearts of the shareholders of the company, and it is well worth the trouble of going down in order to gain something like an idea of what the mine is likely to produce.

Of course estimates in such a case—even the estimates of mining experts—are only approximations in which there is more or less of mere guesswork; but there need be little hesitation in applying to these properties the remark by which the Queen of Sheba of old expressed her admiration of the wisdom of Solomon, that one-half had not been told her. Any of the shareholders who can do so would be wise to make an excursion to Colorado, and judge for themselves the prospects which are opening up before this company. I am sure that none of them would go away disappointed. Mining, as it is now being carried on upon these properties, is reduced to a science, and although it is impossible to exclude all elements of uncertainty, the old analogy between mining and gambling does not apply in such circumstances. I believe it may be fairly maintained that there are not as a rule more risks in mining than in any other legitimate business, not excepting banking. The disappointments so often experienced are due to the folly of the operators more than to the character of the work itself. The time is fast coming when this will be universally acknowledged, and nothing is better fitted to hasten the advent of such a period than the skilled and prudent operations that are now being carried on by those responsible for the administration of "the English Company." In illustration and proof of this, I shall

in a subsequent letter, endeavour to describe the great work that is being done in saving manual labour, and thus reducing the cost of mining, and in particular the advantages that are resulting from the introduction of the Frue Vanner machine or ore concentrator. I have written enough, however, for one letter.

J. S. H.

Denver, Colorado, Dec. 10.

DIAMOND SHARES AND DIAMOND TRADE.

SIR,—The year closes with anything but a cheerful look-out for the investors in diamond shares, nor is there much prospect of improvement in the immediate future. It is true there are a few (but very exceptions, where the investor can look on with complacency for the future, but still for a steady improvement, diamond companies are not of the character to be recommended. Diamonds are too much a luxury, affected by bad trade and political disturbances, and not always profitable to mine. The present period, anyhow, is such. Since the depression in this trade, these last three months, it must be unprofitable to keep on working, and to stand still is equally bad, as some companies might wind up just as well as once. At a meeting of a company a short time ago, a great wisacre suggested that the companies should club together to cease working to reduce the production of diamonds, and thus force the price of the rough up. This gentleman is in the same position as a person losing his way in a fog on a railway line—to remain on the up line he runs the danger of being killed, and to step on the down line is equally as risky.

Rough diamonds have, these last three months, receded every week, still with the lower prices, the Amsterdam and Antwerp polishers refuse to purchase, except very little to keep their men at work. These buyers get wary, for they are not so sure whether what they buy one week they can have much cheaper in the following week. Speculation is entirely strangled, for the majority of the rough diamond merchants have their capital pretty well locked up in scrip, in most cases, and cannot, as in former falling markets, but the rough to keep in stock. *Sic transit gloria mundi!* Fifteen months ago the promoters of companies did not know where to stop in asking premiums for their shares, and to-day they would be glad to sell their scrips at great sacrifices, in fact, at nominal figures. One of the finest industries, and for the interior of Africa, of great importance, has been ruined entirely through the greediness of promoters, of course connected with the rough diamond trade. They dug their own pit, however, and fell in themselves. Good paying claims ought to have been started with less money for the promoters' pocket and more working capital to work with, instead of which they begin to raise new debenture capital, and the shareholders groan under it. To start with, companies ought to have been formed for tens instead of hundreds of thousands, in one case even to 700,000.

HATTON GARDEN.

London, Dec. 28.

GOLD AMALGAMATION, AND THE SICKENING OF MERCURY.

SIR,—I have just received the Journal of Sept. 2, containing advertisement of the Gold Amalgamating Company, and a plan and description of Mr. Readwin's patent grinding and amalgamating machine. I have read both with interest, and while it is pleasing to me, as it must be to all gold miners, to note that Mr. Readwin has discovered a chemical process whereby the sickening and flouing of mercury is prevented in treating certain descriptions of ores I cannot congratulate him on his choice of apparatus—the Britten pan, for notwithstanding the improvements claimed by Mr. Readwin, it will be found to be a very ineffective machine, and certainly one of the most costly that could possibly be devised.

My first experience of the Britten pan, as I think Mr. Readwin's must have been too, was at the Clogau. There Capt. John Parry (who I notice is now meeting with success at Glasdir) extracted some hundreds of pounds weight of gold by means of these machines, but from exceedingly rich quartz. The machines were exactly the same in form as those shown in Mr. Readwin's plan. Their great defect was, as indicated by Mr. Readwin, that the points of pestles wore away very fast, and the mercury well at bottom of pan, with the centre projection too, were cut up very quickly with comparatively little work. To remedy this my father in 1866, being then engineer at the Clogau, made use of the worn out pestles, turning a face on the ends and tapping therein hardened steel points. In machines that he has recently been making he has always put these steel points in the pestles, and a corresponding one in the mercury well at the bottom of pan to hold the pestles obliquely. There are four of such machines at work here, and, as the mine is very difficult of access, it was necessary to make the pans and pestles each in two parts. When we commenced working it was found that the steel points of pestles acted like boring bits, cutting up the bottom of the pan around the steel centre stud, producing finely divided iron, which got so mixed up by the trituration with the amalgam that we could not by any means separate or clean it but by retorting and treating the residue with acid—a costly and tiresome process. Afterwards I chipped out the recess in pan so as to take a dish steel washer, which was hardened and secured in position by the steel centre stud. This alteration reduced the amount of fine iron to a great extent, but there is still a good deal produced.

It will be seen from the above that all the principal of Mr. Readwin's patented improvements in the original Britten pan have been anticipated, while the continuous feed arrangement, and the locking of the amalgam discharge plugs do not appear to me to be of any service; for, as far as my experience goes, the Britten pan will not treat mineral if fed continuously; they will simply discharge it in the same state as received. The *modus operandi* here is to charge about 30 lbs. at a time, and let the pestle crush and triturate same for about 20 minutes, and then wash off. Of course the more automatic a machine can be made to work the more efficient it is, and herein lies the great advantage of well constructed stamps. Mr. Readwin has not provided a cover for his pans, and it is scarcely to be expected that a man would go to the trouble of disengaging the plugs at bottom even if not locked (as Mr. Readwin provides) when it is infinitely less trouble to throw the machine out of gear and take the amalgam out from the top either with his hand or a scoop or ladle. The machines could be geared so that they could not be stopped unless by an authorised person, but after all, if the machine is not covered, the amalgam can always be fished up by a properly constructed scoop. The only means of preventing theft is a properly constructed mill house and an organised system of search on the ingress and egress of the workmen, even to the extent of a complete change of clothes and a bath if found necessary.

Other objections to the Britten pan are its unportability, and the small amount of work it will do. As the crushing power depends entirely on the weight of the pestle, they have very little effect if made less than 7 or 8 cwt. apiece. Now to get a piece of this weight up here is, if not an impossibility, a work of months, and means a cost of hundreds of pounds per ton. As it is, though the pestles are made in two parts, the machines which cost 251. each in England have cost 751. each to bring here, making a total of 1001. Again, a Britten pan with a pestle of 7 cwt. will not, under the most favourable circumstances, crush properly more than ¼ ton of quartz in 24 hours; thus to crush 100 or 200 tons per day, as is the case in some of our large gold mines, a considerable mechanics department would be required to keep them in order, and the cost of 200 or 400 machines and their maintenance in working order would be enormous. At this mine, and I daresay there are scores of mines in the world as disadvantageously situated, it would cost to purchase and put up this class of machinery sufficient to treat 50 tons per day at least 15,0001., and stamps to do the same amount would not cost half the money. Besides the Britten pan will only treat stuff about a ½ in. cube, while stamps will take it 1½ in. or more.

My idea in bringing out the few Britten pans that I have was to treat in them rich portions of mineral that it would not be advisable to put in the stamps. My object in writing is not to attempt in any way to throw cold water on Mr. Readwin's scheme, for really if the secret process he has in his possession will do what he claims for it, it does not matter what class of machine is used, and it will prove to be a boon to all who have the cares of amalgamation to contend with; but I simply say that what Mr. Readwin claims as improve-

ments in the Britten pan have been anticipated, and even if they had not been, they are not worth the expense of protecting by letters patent. Nothing can touch well constructed stamps like those of the Californian type, amalgamated copper plates below, and afterwards Hungarian pans. These will catch all the free gold. At the great Callao Mine two-thirds of the gold is obtained from a comparatively small area of copper plates, and any passing these will surely be taken up by the Hungarian pan. To follow these should be constructed a complete system of slime apparatus, for concentrating the tailings and the pyrites, which, as a rule, contain the troublesome part of the work would then be reduced into compact form for calcination and retreatment. This apparatus can all be arranged so as to guard against theft—one of the points Mr. Readwin lays stress on; and if by using Mr. Readwin's preparation of mercury their efficiency in treating pyrites and other difficult minerals can be enhanced, there is no doubt whatever that a great demand will spring up for the article in all parts where gold is mined, and thus Mr. Readwin's long period of labour in this direction will meet with the reward it so richly merits—the veritable salts of gold.

JAMES G. GREEN,
Superintendent, Organos.

Organos Gold Mines, U.S. of Columbia, Nov. 1.

THE COAL FIELDS OF INDIA—THE KISTNA DISTRICT.

SIR,—To any of your readers who have found interest or amusement in the letter with the above heading in the *Mining Journal* of Oct. 14, I cannot do better than recommend a perusal of the paper criticised therein; it is published in the current number (November, 1882) of the Records of the Geological Survey of India (to be had of Messrs. Trübner, Ludgate-hill). It presents a very circumstantial narrative, with full references to public documents, of a remarkable claim to discovery that has for more than 30 years attracted notice in India. I am quite satisfied that the original will form a complete antidote to the criticisms made upon it by Gen. Applegath, who seems to think that the Geological Survey of India is a conspiracy to falsify its published work, in order to defraud him of his rights. Only one general caution is needed; the case at issue referred exclusively to an area known as the Palnad, forming the northern extremity of the great basin of Kadaph (Transition) rocks described in the Survey Memoirs, vol. viii, part 1, 1872. Gen. Applegath's diversions to the Singareni coal field, the Godavari basin, or the coastal region of the Kistna district are wholly irrelevant.

Calcutta, Nov. 28.

H. B. MEDLICOTT,

Superintendent, Geological Survey of India.

Note on the Supposed Occurrence of Coal on the Kistna, by H. B. MEDLICOTT, M.A., above referred to:—

The Records of the Geological Survey of India would be incomplete without some mention of the reputed discovery of coal near Jaggaipet, in the Kistna district of Madras, that has so often within the last 30 years been urged upon the notice of Government by Gen. Applegath. It has this year been brought forward again with unabated confidence; and the following Note upon the question was drawn up for the information of the Government of Madras. It affords a curious contemporary illustration of science in *excalina*.

I have the honour to acknowledge receipt of your letter No. 230 E., dated June 13, 1882, forwarding for remark a letter, dated May 19, from Major-Gen. F. Applegath, on the subject of his alleged discoveries of coal in the Kistna district. I had already noticed in the newspapers, English and Indian, the revival of the Kistna coal question, and I am glad of this opportunity of submitting some remarks thereon for the consideration of the Right Honourable the Governor of Madras. . . . It is not to be believed that the Government or the public would, for a moment, place the judgment of one so completely uninstructed in such matters as Gen. Applegath, that the rocks of the Palnad belonged, in whole or in part, to the already established coal formation of the Peninsula, in competition with that of the Geological Survey, that they were all of Transition or Lower Vindhyan age, the two being as widely separated stratigraphically as are the Jurassic and the Silurian systems of Europe. The fossils sent by the General in support of his contention were not fossils at all, and his rock specimens scarcely bore any resemblance to the standards to which he referred them. The occurrence of coal in those older rocks would, of course, be an independent question; and, although a very extensive survey of them in that very field and in other parts of India had revealed no trace of a coal measure group, there would still remain the possibility of a local deposit. The question is thus brought within very definite limits of fact, and it would never have taken shape but for Gen. Applegath's assertion that at a particular spot, within 20 ft. of the surface, he had once upon a time quarried and burned it. To anyone whose ideas on the subject were not altogether in the air nothing could be simpler than a complete verification of such a statement. It is practically impossible that several tons of coal could be extracted and leave no trace to tell the tale, yet with every appliance of tools and skilled labour, funds, and time Gen. Applegath has never again been able to produce an ounce of any substance that would support combustion. He has, however, never ceased to reiterate his assertion, and his confidence has imposed upon others no better informed than himself, the strong wish for the realisation of his assurance being on both sides the efficient motive of assent. It is a striking instance and an instructive caution upon the persuasive influence of unflinching testimony in a credible witness, for no one that I know of has ever cast a suspicion upon Gen. Applegath's truthfulness.

In its successive orders giving sanction and encouragement to General Applegath's explorations, ignoring its own previous adverse decisions upon the case, Government did not, of course, give reasons for so doing; but we may safely take these to be the same as those that guide public opinion in the matter. In a Calcutta daily paper of March 28 last, *apropos* of General Applegath's recent manifesto, it is said, "This case of coal in the Kistna district is probably another instance in which practical men have been ahead of the geological theorist." Nothing but the diffusion of knowledge can remove the popular delusion that is revealed in this sentence.

The acts and arguments referred to imply more or less of credence in General Applegath's frequent animadversions upon what he takes to be the carelessness, the contradictions, and the obstructiveness of the Geological Survey. I do not care to exhibit the ridiculous misunderstandings upon which such remarks have been based. Too much time has already been wasted over this tiresome business, and I have shown that the whole question turns upon a simple matter of fact. The supposition that a body of professional men could be so infatuated as to pooh-pooh a project founded on so circumstantial a basis, which, if true, must inevitably be presently substantiated, is only further evidence of the hazy view taken of the conditions. Until this ground had been visited the Survey gave every encouragement to the investigation. It has been said that Dr. Oldham's visit to the Palnad, in company with General Applegath and others, was made in a perfunctory manner. But this, again, is unfair. Dr. Oldham went to see all that General Applegath had to show regarding the existence of coal, and finding no vestige of real evidence, it would have been foolish of him to sit by while a boring was made in slate, on the chance of unearthing a coal seam. Dr. Oldham officially and publicly (Madras G.O., No. 1125 of April 27, 1868) denied the statement that anything like "burnt shale" or "burnt outcrops," or "a substance rich enough to support combustion," had been seen. Since then, and before it, General Applegath has had ample means and leisure given him to make good the statement that he had once burnt coal extracted from the site in question, but all his endeavours have been in vain.

As it is not a ghost story some intelligible explanation of the mystery must be forthcoming. The most likely one was suggested by Dr. Oldham, that, to please their master, the natives had put some real coal in the hole and produced it for his satisfaction. A hoax of this kind was shortly after successfully practised upon Dr. Oldham himself, and all the officials concerned, in the famous case of the Midnapur borings. In the Kistna case, however, there was hardly room for this without culpable blindness on the part of the victim, for the excavation is said to have been a shallow drift; and accordingly General Applegath repudiated the "insinuation," averring that he had himself conducted and seen the operations.

The oldest papers I have on the subject are a manuscript

map and two sections, with a brief list, all signed "F. Applegath, Lieutenant, Assistant Civil Engineer," and dated "Camp Moogetalah, Dec. 18, 1850." The map is entitled, "Plan of the marble fields near Jaggaipetta on the Kistna and Pallair rivers," and, with the sections, it is coloured geologically (after a fashion). There are five pits marked on the plan, and the list annexed is headed "Description of the pits, &c., that have been sunk in searching for coal." One of these pits is at the very place assigned for the coal discovery, on the left bank of the Pallair, about half-a-mile above its confluence with the Kistna. This pit is figured on one of the sections to the full depth ever said to have been attained there, and the only legend is, "Shaft 20 ft. through slate, with a soft material below; thickness unknown." In the list the same is described as "Pit No. 3, shaft sunk 20 ft. through slate; small but distinct traces of vegetable deposit at the lowest excavation, and a soft, white deposit at the bottom of the shaft; thickness unknown." In these original documents the word "coal" only appears in the title of the list as a desideratum, the rock in the pit being correctly noted as "slate." The date usually assigned by General Applegath for his discovery of coal is 1851, so it might be surmised that these notes are anterior, and not to the point. It seems not improbable, however, that they represent the total result of his operations before going on leave, when he reported his discovery to the court of directors, and, before leaving, to the Madras Government, for the map is endorsed "Lieutenant Applegath's supposed coal sites; from Walter Elliot, Madras C.S., August, 1851." If this be the case there would be no escape from the judgment that the quarrying and burning of coal must take rank as a myth. So important a piece of evidence would certainly not have been left out in the contemporaneous account. No doubt many tons of the black slate were excavated, and nothing is more likely than that pieces of it were put into a good camp fire, after which ordeal they would bear a tolerable resemblance to ash, and such may have been the small basis of fact which has grown so portentously. The samples of this stuff deposited at the Madras Museum would excusably have been thrown out as rubbish.

The next evidence tends to confirm this view. It consists, again, of a coloured map and sections, with a report entitled "Captain F. Applegath's description of the geological strata on the north bank of the Kistna," dated Madras, April 28, 1861. In this the same shaft, apparently, is referred to (here marked as No. 1) thus:—"An attempt was made some years ago to sink No. 1 shaft for coal through the red shale in the southern part of these fields; the red colour appears to be superficial, for, at a depth of 10 or 15 ft., the colour changes from red to greenish-grey and blue, and sometimes black. . . . This occurred in 1851." . . . In August, 1866, Major Applegath submitted a memorial to Government, soliciting aid for further exploration, again urging the identity of the rocks with the Indian coal measures, but the "myth" now takes distinct shape, thus:—"I here most distinctly state that, on the occasion of one of my visits to the locality I have described, on the Palair and Kistna Rivers, I burnt, in several large heaps, the coal I had quarried, and that I even carried some and burnt it in the Sherhomepettah Bungalow compound. I believe that not less than 9 or 10 tons were quarried and burnt, and that, while burning, it gave out great light and intense heat, and, except that it was much heavier, it was not unlike the Torbane hill mineral." Due mention is, however, made of failure to re-discover that combustible rock:—"Having once quarried and burnt the coal on the Kistna, I am not discouraged by my recent failure to reach the coal, and this dear-bought experience will prove invaluable in the next attempt. I am confident that coal exists there; its extent and thickness it is impossible at present to estimate." This application was referred to Dr. Oldham for opinion. Dr. Oldham deprecated boring until some fair evidence of the probability of coal being found should be established, remarking that "it would appear only reasonable to expect that Major Applegath should be able to show where he had quarried the coal, and the expenditure of very few rupees, not one-hundredth part of what borings would cost, would in a few hours prove the existence or non-existence of any bed of coal." He offers to arrange for a geologist to visit the ground in company with Major Applegath. This visit took place in January, 1868, Dr. Oldham going himself. He was accompanied by Colonel Applegath, Mr. Stuart (assistant collector of the district), and Mr. C. Oldham, who had been for some time engaged upon the examination of the same rocks further to the south. In the report of his observations Dr. Oldham remarked:—"After this careful examination, I regret to report that, in my opinion, there is no ground for any hopes whatever of coal being found within this area. The rocks are all of types well known, and covering a very large area of the Cuddapah and Kurnool districts, and in no respect that I could see do they, in this part of the country, offer any feature which would induce one to suppose that there was a greater probability of coal being found here than at a thousand other localities within the very extensive area over which similar rocks extend to the south, and at some one of which it would, I think, certainly have become known did it exist." As no more of the so-called "coal" or combustible rock could be found, the suggestion is made that it may have originally been provided for the occasion.

At this juncture the episode of the Midnapore coal adventure occurred, raising sanguine hopes that coal might be found anywhere. In April, 1870, a memorandum was forwarded by the Madras Government, urging further search in that Presidency, saying there seemed no reason why coal should not be found beneath any of the vast tracts of laterite in Southern India as well as at Midnapore. Dr. Oldham (being then under the deception as to coal at Midnapore) gave a reasonable answer (June, 1870), explaining the different conditions—how all the measures of the Raniganj coal field passed eastwards under the alluvium of the Ganges delta, and how impossible it was for anyone to say how far they might or might not there spread out to north and south on the buried slopes of the geissic upland; that there were no analogous circumstances in the laterite regions of Madras, &c. But all this was as moonshine to the promoters of such a scheme, and a profound distrust of geological insight remained; nor was faith restored when the fiasco of the coal at Midnapore was made known, for had not the geologists been taken in just as others. General Applegath was not slow to take advantage of these favourable conditions. In July, 1870, he applied for a grant of money and a detachment of sappers and miners, equipped with boring and blasting tools for exploration in the Kistna district. The geological affinities of the rocks were not referred to, the one tempting assurance given being that he had once seen coal quarried and burnt in large quantities in that district. Approval and sanction were at once accorded (G.O., No. 1024, Aug. 15, 1870). When the two months allowed were nearly expired, an extension of time and an additional grant were asked for. . . . The request was at once granted (G.O., No. 42, Jan. 11, 1871). The total results of the explorations were submitted in a paper headed "Conclusions," dated Feb. 16, 1871. There is no allusion even to the non-discovery of anything combustible, or to the sanguine hopes so recently expressed regarding coal. There is nothing in the paper but a rambling discussion of a collection of the rocks, attempting to identify them with the Indian coal measures. Col Applegath was thanked for his exertions, and the specimens were ordered to be sent to the Geological Department for opinion (G.O., No. 336, March 15, 1871). Dr. Oldham's memorandum (May 12, 1871) on these specimens gave a complete demonstration that Col. Applegath had no rational idea of what he attempted to describe, and pointed out the utter waste of investigations so conducted.

In this interval the survey of the great basin of the Cuddapah and Kurnool rocks, of which the Palnad forms the northern extremity, was completed by M.M. King and Foote, as published in vol. vii, pt. 1, of the *Memoirs* (June, 1872). . . . be placed in the Kurnool or in the Cuddapah series of transition rocks; but no possibility presented itself of any belonging to the Gondwana system, although, of course, the surveyors were fully informed of the coal controversy. This transition basin is in the area which Gen. Applegath now presents as likely to become the largest coal field in India. From there Mr. King went northwards, and at once identified the coal measure rocks in the Singareni field, and found coal there.

Nothing daunted, and absolutely impervious to professional criti-

cism, General Applegath, in Sept., 1873, submitted to Government another map and description of the Jaggaipet District, with suggestions for further borings for coal, and remarks on some diamond strata in the neighbourhood. It is simply a repetition of all the old fallacies and assertions—giving names to the imaginary fossils, and impossible correlations to the rocks, with heroic composure, as if nothing had ever been said to the contrary. The maps and notes were ordered to be printed and circulated; 12 copies to be furnished to Colonel Applegath, with the best thanks of Government for the valuable information they afford (G.O., No. 1020, Sept. 30, 1873). I happened at the time to be officiating for Dr. Oldham, and I was called upon by the Government of India for any remarks I might have to offer. My answer may not have been forwarded to Madras. In March, 1874, I submitted to Government a detailed note on this map by Mr. Foote, who had surveyed that ground; his remarks would satisfy anyone having some knowledge of geology. In April, 1874, I had the pleasure of an interview with Colonel Applegath on his way through Calcutta, prior to leaving India. He informed me there was a proposal on foot for a renewed search for coal in the Palnad by the Public Works Department; and as he expressed himself satisfied in every way with this arrangement I got him to mark on his own map the spots at which he most desired borings to be made. In the hope of putting an end to this tiresome craze, I forwarded these indications to Government, recommending that the borings should be undertaken when Mr. Vanstavern could be spared from the borings in the Bedanól coal field in the Godavari district. . . . The borings (says the report) have been made as close as possible to the pits dug by Col. Applegath, and in every instance have been sunk considerably below the bottom of the pits; in addition to this, Mr. Vanstavern, at my request, cleared out the horizontal shaft, in which it was understood Col. Applegath found something resembling coal, which he was able to burn; but nothing was met with except shale. I am puzzled to know what the substance was which Col. Applegath supposed to be coal; but some of the stuff brought up from the borings, which is described as 'black clay shale with graphite,' and 'dark brown clay,' might, it appeared to me, be supposed to be taken from the immediate neighbourhood of coal. My own opinion is of little value; but I am anxious to state that I watched the operations with much interest, and was rather predisposed to think Col. Applegath's views were correct. I believe I may say that, up to a certain point, Mr. Vanstavern seemed to agree with me; but after several borings had been made, and the country round explored, he informed me that he had little or no hope of finding coal." On this report His Excellency the Governor in Council declared himself to be quite satisfied as to the completeness of the investigation carried out for the exploration of Col. Applegath's supposed coal field on the Kistna (Madras G.O., No. 761, March 11, 1875).

Not so, however, General Applegath; as, indeed, might have been expected from the obduracy he had formerly exhibited in the face of previous ample refutations by himself and others. . . . He objects that all the places he had recommended were not explored; this would indeed have been a trial of patience, and a culpable waste of time after the principal places, those selected by himself, had proved complete failures; one of these indeed should have sufficed, the one where coal was said to have been once extracted. Four borings were made at this spot, all deeper than any of the original pits; but what is most important, the actual drift from which the supposed coal was obtained was opened out and explored, but no vestige of combustible matter was found. The General offers no remark upon this collapse. I have no doubt whatever that a jury of practical men would give an unanimous verdict of 'proven' against Gen. Applegath's coal in the Palnad. One very interesting observation in Gen. Applegath's remarks to the Society of Arts remains to be noticed, as it throws much light upon the mystery that attaches to this romance of coal on the Kistna. I pointed out at the beginning that the General's *cheval de bataille* throughout the whole contention has been his assertion that, once upon a time, he had quarried and burned coal on the spot where now it has been shown no coal exists. But for this unmistakable evidence he would never have been listened to; in fact, he did not obtain a practical hearing until he mounted his charger in full panoply. In the original contemporary documents (1850) there is no mention of this discovery; in the unofficial report of ten years later, it is casually quoted as a combustible rock having 30 per cent. of carbonaceous matter; but in the official memorial of 1866 it has become coal giving out great light and intense heat. This is the familiar process of genesis of the myth; and such I take Gen. Applegath's coal to be. In paragraph 7 of his "Record of the Kistna Coal" (from the *Journal of the Society of Arts*) there is another very neat and instructive example of the same kind of performance; the old steed having broken down, a fresh one is trotted out from the depot of memory. Of the black clay from Mr. Vanstavern's boring No. 6, it is remarked: "I believe that this black stuff is coal that has been partially burnt, as it has the appearance of coke, or burnt coal, and, under a magnifying glass, it presents every appearance of coke, or burnt coal, and, when ignited, burns like a coke fire." It may even be a natural bed of coke." The italics are mine. I am not aware that any of this clay was sent to Gen. Applegath, but that would not signify; it is assumed to be the same as some black stuff he had once thrown into the fire and beheld to become red hot. The General evidently "walks by faith;" in a letter to the Overland Mail, refuting the conclusive evidence of Mr. Vanstavern's borings, he remarks:—"Quite on the contrary, the very important question of coal or no coal near Jaggaipet (Mr. D.V.), I believe will, be definitely settled in the affirmative, if a little trouble can now be taken by the authorities in Madras." It would be sacrilegious to gainsay this final appeal to Providence, but I think the game is played out."

TRANSVAAL GOLD FIELDS.

SIR,—Will you kindly allow me space for a few remarks on your Kimberley correspondent's letter, published in your paper of the 16th inst., in which reference is made to the Transvaal Gold Fields. In the second paragraph of his letter your correspondent writes—"From the old diggings there is not much to report. At Pilgrim's Rest a party has sunk through what is known as Rotten Reef, proving it to be merely a superficial deposit. However, from my own knowledge of the place I am able to say that if the proprietor spent about 100,000*l.* in diverting the course of the Bluid (sic) River (known as Blyde River), in two places there is sufficient payable ground to give a fair percentage on their outlay. At Mac Mac there is little or nothing doing. At Spitzkop there is a steady improvement, but there are only a few people there. The work is of a most primitive character, and not calculated to produce the satisfactory results." Now without doubting for a moment that your correspondent received the information about a party having dug through a rotten reef, &c., permit me to say that when I was at Pilgrim's Rest in October last I did not hear of any such operation or result, but even if this had occurred at any particular spot, what would it prove? And it should be known that these rotten reefs extend over a large area on the farms of Grootfontein and Ponies Krantz, and that on these farms there are some 16 or 18 claims (at least measuring 300 by 400 ft. each claim), some of them of surprising richness, and which have been worked to a considerable depth, and none of these have as yet shown the result as stated by your correspondent—in fact quite to the contrary. I readily admit that want of water is a great difficulty, but I venture to say that this can and will be overcome for a much smaller outlay than 100,000*l.* As to the richness and permanency of these so-called rotten reefs on Ponies Krantz, Grootfontein, Spitzkop, and Waterfall there is not much room for doubt, as will shortly be abundantly proved, and the same may be said of the newly discovered Kaap diggings in the same district. What the investing public just now have most to be on their guard against is speculating in farms in and about the district of Lydenburg, which are said to be gold-bearing, because adjacent to the known gold fields. Too much caution cannot be observed in dealing with these farms. Some are, no doubt, all that they are represented to be, whilst others have not as yet shown any evidence of payable gold, nor would the formation warrant the supposition. The originally proclaimed Lydenburg Gold Fields, including Pilgrim's Rest, Mac Mac, Spitzkop, &c., will bear the

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fullest investigation, and if fairly and honestly managed will amply pay investors for their outlay; but, unfortunately, there is so much confusion about these diggings as to locality, &c., that very few in this country seem to have any clear knowledge about them. For instance, in many of the accounts, diamond and gold digging are most delightfully mixed up together; but, perhaps, it might surprise some of your readers to be informed that the seats of their operations are 600 miles apart, and the most rapid communication from Kimberley to Lydenburg occupies eight days. With your correspondent's remarks on the present political situation of the Transvaal, I have neither sympathy nor concern, but I am very glad to be able to say that, from letters from the district later than the date of his letter, I do not learn that the Boers have sustained any great disasters at the hands of the Kaffirs. And as to the Kaffir chief Mapoch, ever conquering the Transvaal, we may rest assured that that is a very remote probability, whatever the good wishes and intentions of the Kimberley people may be on the subject.

I can fully endorse much that your correspondent says with reference to diamond field affairs, in which he is well posted and experienced, and I hope he will pardon me for saying that in reporting on the Transvaal Gold Fields he is not so happily circumstanced, for instead of writing from observation and experience, his remarks are based on secondhand and insufficient information. If not trespassing too much on your space and you will permit me, I purpose in an early issue of your valuable paper having something to say on "The Transvaal Gold Fields, and Hydraulic Mining," about which I read in your Journal of the 16th inst. G.

"MULLOCK."

SIR,—At the meeting of the Mysore Gold Mining Company, held on Dec. 21, Mr. John Taylor defined the word "mullock" to mean "a sort of soft clay in which there were spots of gold coming there by the disintegration of the quartz reef." Without entering into any question as to the accuracy of this somewhat singular statement it may be desirable to remark that "mullock" is a word much used in the mines at the Antipodes, and that Smyth defines its meaning as "rubbish dirt, stuff taken out of a mine, the refuse after the veinstuff is taken away;" in other words, synonymous with the Cornish term "atle." I shall be glad to know in what part of the world the term "mullock" bears the distinct meaning given to it by Mr. John Taylor. Perhaps he will reply through your paper.

VICTORIAN.

CALLAO BIS GOLD MINING COMPANY.

SIR,—I enclose copy of a letter I have written to this company in reference to their having recently struck the "Callao" lode; and as it may prove of interest to the shareholders as well as to general readers I trust you will be enabled to give it a place in Saturday's Journal.—*Under-place, Dec. 23.* GEORGE ATTWOOD.

To Mr. J. H. Thornton, secretary, Dec. 22: Dear Sir,—I have had much pleasure in receiving your circular, dated the 20th inst., announcing that the "Callao" lode had at last been cut. As the late engineer of your company (as well as a shareholder) I congratulate you upon being successful, and I have no doubt you have a most prosperous future, and that your property will soon become a dividend one. I must, as well as other shareholders, regret the great delay which has attended your mining operations for the last two years. On Nov. 16, 1880, I finished my survey of your property in relation to striking the original "Callao" lode. On Nov. 17 I located the shaft and commenced to sink. By Dec. 20 of the same year the shaft had reached the depth of 80 ft. (see report by George Attwood, dated Feb. 1881). I calculated that the vein would be cut at or under 150 ft. vertical from surface. I must again express my regret that it has taken you two years to sink 70 ft., whilst I put down a shaft 80 ft. in four weeks working. I make due allowance for water met with in depth, timbering, &c., but two years is a long time to sink a small trial shaft 70 ft. deeper.—GEORGE ATTWOOD.

MINING IN SPAIN—No. I.

SIR,—It is a well-proven fact that although gold, and even visible gold, may be met with in mines, still they often cannot be worked to any advantage. I had offered to me in January last a gold mine in the province of Toledo. It was reported to be exceedingly rich, and although at the time the offer was made it was not being worked, still it was reported to be in a position to allow stopping at once. As the proposed conditions were fair for a good mine, I determined to visit it in order to move in the matter with every security. I, therefore, started on my journey, reaching Madrid in due course. My correspondent lived here. After a conversation, which threw no further light on the matter than that he himself was not the proprietor, but only the agent of the lessees, I was introduced to those gentlemen. Here I was shown some half dozen buttons of the gold, of about 1/2 oz. each, and some large and small pieces of ferruginous quartz, having a fine sprinkling of coarse gold. I was further shown plans, deeds, &c., which satisfactorily proved that the mine evidently existed, and as the sight of the precious metal in its original casing acts as a strong incentive to quick, forward movements, I lost no time in deciding to "make tracts" for the mine. I was informed that arrangements had been made for the capataz at the mine to meet me at the Talavera railway station on the following day to accompany me to the spot; he had also been instructed to call my attention to every part worthy of notice. Having passed a restless night, dreaming of nuggets and piles of quartz so rich that the yellow golden hue seemed imparted to everything around, the hour for starting for the railway station at length came round. After securing a corner of the compartment, and settling myself for a run of six hours, I had the pleasure of entering into conversation with a very interesting Portuguese family who were en route for Coimbra. The paterfamilias is proprietor of a rich antimony mine in Portugal, which since then I have inspected, and found to be as represented. More, however, of this on some future occasion. A run over the white dusty tableland of Central Spain on a hot summer day is anything but comfortable or cheering. The whole of the surface seems parched, water is scarce and bad, and there is but slight variety in the scenery throughout the whole run from Madrid to Talavera, and it was with a hearty sigh of relief that I at last welcomed our stoppage at this latter station. On the arrival of the train there was, of course, the usual rush of friends welcoming friends who, by the way, form most elaborate tableaux and scene in all stations of the second order through this part of the country. Not having any friend to welcome me, I had leisure to look around and note what was going on. There were groups of surly looking faces about, which seemed to be all eyes and stumpy black beard, overtopped by broad black hats, shaped something like prospecting dishes, the brims being kept from flapping by a wooden hoop, 1 in. wide, tacked to them on the inside. This hat is an invariable mark of the district.

Whilst I was speculating as to whether any of those faces belonged to any celebrity in bandit line (for which, by the way, this province is very celebrated), I was saluted by one of them, and about the darkest and most sinister looking of them all with *buenas dias, Senor, viene V. para ver la mina?* I concluded this was the capataz who was to act as my guide. I found on enquiry that I was right in my conjecture. Having placed himself at my orders, we prepared to start for the town of Talavera, distant from the station about 1/2 mile. I found that my guide had secured seats in the diligence for himself and me, and set it down to thoughtfulness on his part. It was certainly better to ride the 1/2 mile than to walk it (the shakiness of the vehicle, notwithstanding); but on reaching the town I was called upon to pay for both. At the time I thought that he must have taken a season ticket by that coach because of the charge; but on mature consideration I have altered that opinion, and have now decided that he would have made the necessary arrangements to secure his commission out of every single payment I made whilst in his company. A bandit of the ordinary class. As starting on the 21 miles ride at that hour of the day was out of the question, I determined to make the most of my time, and see what I could of the town and its surroundings.

The first spot of interest to every Englishman on his arrival here is that where so many of our brave countrymen sleep, almost forgotten

after the battles fought on that ground on July 29 and 30, 1809. This district lies at a short distance from the town. Having secured a horse and a guide I started for the Medellin Hill, a small eminence, which on these memorable days was held by Gen. Hill and his valiant troops. On reaching it I could again, in fancy, people it with the struggling forces, the British driven from it by the overwhelming forces of Ruffin and Villate, only to retake it again in their usual sturdy, silent manner, at the point of the bayonet, the black night of rest only broken by the groans of the wounded and the shrieks of vultures, the anxious look out for daylight, again to begin the struggle, to lose or conquer, to live or die. Day breaks. To arms sounds. The battle again begins. The roar of cannon has frightened to a distance the vultures of the night, and the dance of death is proceeding. One dire struggle. A cavalry charge. Villatte's troops falter, Wellington pours in his reserves, and the battle is won. The now broken masses become a medley crowd of fleeing soldiers. *Sauve qui peut.* In the fight there were 28,000 infantry and 6000 cavalry engaged on the French side, of which 7389 were left on the field; there were 17 pieces of artillery taken from them. On the allied side there were 16,000 infantry and 3000 cavalry engaged—6268 British gallants and 1200 Spaniards died. On this, like every other occasion throughout the Peninsular war, we had to do the hard work, and got but bare thanks for doing it; and to-day our services on that occasion are, by the majority of the people of this country, looked upon as having been of small account—in fact, they turned the French out. A storm is near; the clouds shut out the sunlight as I move away from the hill; there is a sudden gust of wind which raises a cloud of dust about me. Is there any of the dust of the mighty dead mixed with it? Probably yes.

Talavera has been a town of great importance, and has played an active part in the life history of the Church of Rome. It has seven large convents and monasteries, and about an equal number of churches and hermitages. Half a glance is sufficient to show that the fraternities flourished, and grew fat here some centuries ago. But alas! like all recorded history they had their entrances, and have now had their exits. Here their glory has departed. One of the largest monasteries is to-day turned into a wax match and candle manufactory, which is reported to be flourishing. Others are occupied as timber warehouses, another as a petroleum depot and a hermitage, which, gilt and tinselled, occupies nearly as much ground as Westminster Abbey, and has all except its chapel occupied promiscuously. A large portion of it is laid out for a bull ring, where many a poor brute is maddened and tormented by still greater ones; other portions of it are used by gitanos, who stall themselves and their donkeys there, whilst a very small portion is occupied as dwelling houses. The chapel is small but very fine; were it free from the paint daubed over it in the most glaring colours it might be considered a gem. The lower portion of the interior walls is faced with cobalt painted tiles, the upper row being figures. Here are a few of the celebrated men of Bible history, and a great many of those celebrated friars and abbots of the Roman church, whose history has passed away, and whose deeds outside of good living were probably few. There is a very beautiful altar piece, and Talavera seems to still have a fair number of smart priests, and very devout young and old ladies. I cannot say so much for the boys, because as I passed along one of the streets I came upon a number of schoolboys, satchel in hand, busily engaged in pelting the remnant of a poor San Jose, which stands over one of the entrances to a deserted convent. This very image had at no distant time been worshipped by the mass, and had anyone dared them to throw a stone at it he would have paid the sacrilege with his life at the next *auto de fe*. Probably the boys are surfeited, and they go with the times. The Tagus forms the eastern boundary of the town, having here a normal width of about 500 yards, but when flooded it will probably reach 1/2 mile in width.

Having secured the necessary carrying power in the shape of a couple of handy mules, we started on the following morning for La Oriental Mine. We crossed the river by a bridge, portions of which dates from the 14th century, whilst other portions have been built to repair gaps made by the river to the present time. It consists of over 40 arches, and has, owing to continuous patching, an awry and insecure appearance; it is, however, the only way the inhabitants on either side have of crossing the river over a distance of 12 miles up and down. Our route lay nearly parallel with the river's course through a rich valley, composed of the river alluvium for several miles, until we reached a monastery called Las Geronimas, which at a distance appeared to be a town of some importance, but on nearing it we found that it was only the monastery with its very extensive dependencies. We passed on our left, just prior to reaching this demesne of the fat abbots the entrance to their cellars. These had been excavated in the side of the hill fringing the valley we were travelling over, and was reported to enter the hill about 1/2 mile. Two ventilating shafts, surrounded by a wall of masonry and roofed, were visible at some distance, one from the other on the hill side. These bodegas are still used by the present lay proprietor of the estate, but the monastery, with its buildings, are occupied only by the herdsmen and cattle of the owner. We passed through very extensive vineyards and olive groves, all bending under their respective loads, which had been planted and possessed, too, by the friars, but which, like the other temporalities, have followed the course of events, and have been secularised. We reached Las Herencias after riding some three hours, a small town of 1500 inhabitants. The whole of this was formerly a dependency of the monastery we had passed, and here lived the hirelings who tilled and toiled for their fat masters, the friars.

Here we left the river at a tangent, and faced away towards the Montes de Toledo. We passed occasionally extensive olive groves, then large cultivated tracts covered with wheat, then tracts wooded with a heavy growth of large encina trees (a species of oak yielding excellent timber), following the road that had been tramped into the land through continuous use over the same course for ages, but which had no indications of having been laid out by any other means. On reaching a beautiful grove of oaks my companion pointed out a tree to which he had on one occasion been bound for 18 hours by five bandits. He was on that special occasion returning with funds to pay wages at the mine we were going to visit, and had in his possession 14,000 reals (140l.) in silver. This was the object of the attack. He was accompanied by two men, armed, and who were supposed to insure his safety; but as soon as they saw the presenting of the first blunderbuss they did not give its holder time to fire, but bolted; he had to hand over the funds to the robbers, who then tied him up, reloaded the mule he had been riding, and moved off; neither mule nor money was ever recovered. The district seemed very inviting to robbers since there were so many places where a traveller could be surprised without being able to defend himself in any way, the road in some places having banks on either side 30 ft. high, those being crowned with massive oak trees. When we had passed through I thought myself well out of it. J. A. JONES.

Mieres, Asturias, Dec. 22.
[To be continued in next week's Journal.]

WHEAL CREBOR.

SIR,—I was much pleased with the remark made last week in the Journal that "the Georgina lode, which runs through the Crebor sett, produced an enormous quantity of ore many years ago." This lode, I wish to mention, possesses some very extraordinary features, for it is nearly perpendicular; secondly, it runs through a fine elvan; thirdly, and chiefly, many tributaries could take pitches at once in the backs if the attle were cleared, and many more if the water could be drained 5 fms. by a cheap iron syphon, by a force pump, or by any other inexpensive appliance. Here a veteran miner told me he was once engaged the whole of Christmas day in getting out the water, in order that some eminent captain might inspect the lode. Perhaps this was the identical period when two inspectors (more than 20 years ago) reported that "this was a lode of great promise, and could scarcely be called a speculation, as there was every good property in and about it to warrant success." And they added, "that this lode had been worked from the tunnel of the Tavistock Canal; and (note this) that there is ore still standing in the backs, but nothing has ever been done below the tunnel." Besides this, they mention that "the lode is 4 ft. wide, and appears to be going down nearly vertical." Further, "that it has been opened on nearly 50 fms. in length, and is situated about 250 fms. south of the main, or Great Crowdale

lode." This is important evidence, for it proves that in this large sett there are four great lodes—the Crelake, the Bridge, the old Crowdale, and the Georgina lodes. It is also a distinguished feature in this great mine that the ore dips very fast between two cross-courses, and that there is a hot bed of mundic and copper under some deep shaft, which is always the precursor of large courses of ore.

With reference to the adjoining mine, I mean West Crebor, it must not be forgotten that two or three levels containing copper have been actually driven into the sett. Further, that the ground is remarkably easy, something like the old tin mine—Wheal Coates in St. Agnes—where one or two spirited adventurers have within the small space of a week or two quadrupled their outlay. I will merely add, in reference to West Crebor, that a capital steam-engine has been erected; and, lastly, that the captain knows the district, and thus "experience enables him to attain to something like prophetic strain."—Dec. 26. OLD AMATEUR.

COMPARATIVE RESULT OF COPPER ORES SOLD IN 1881 AND 1882.

SIR,—In making the usual retrospect for compiling my annual review and general summary of the quantity and quality of copper ores sold from the mines of Devon and Cornwall at the Cornish Ticketings, it presents a rather more satisfactory contrast on the quantity of ores sold, it being in excess of last year (as well as several years previous, which showed a diminution on the returns), whilst it shows a decline on the produce. This is, no doubt, attributable to the increased quantity and low produce of the Devon Consols ores; the amount of fine copper and values realised on the total sales of ores also show a slight reduction on last year's returns.

In comparing the total quantities of copper ore sold in 1881 there was 40,744 tons, at an average produce of 6 1/2 per cent.; standard, 94l. 3s.; price per ton of ores, 3l. 10s.; fine copper, 2664 tons; amount of money on sales of ores, 141,491l. 15s. 6d.; whereas the closing year gives the total quantity of ores sold as 42,118 tons, at an average produce of 6 1/2 per cent.; standard, 104l. 7s.; price per ton, 3l. 16s.; fine copper, 2049 tons 17 cwt.; total amount on sale of ores, 136,241l. 7s.; showing an increase on the returns of 1324 tons of ores as compared with the preceding year, fully evident that the quality of the ores are deteriorating on its average value, especially taking into consideration the beneficial advance on the standard during the year.

I annex a list of 20 mines, showing the increase and decrease on the sales of copper ores for the past two years. There are 20 other smaller mines occasionally selling ores which are not included in this list, but have sold ores during the year in the aggregate amounting to 1472 tons, and accounted for in the annual returns:—

Mines.	1881.	1882.	Increase.	Decrease.
Bedford United	656	916	260	—
Devon Consols	10,334	11,499	1165	—
East Pool	936	383	—	555
Gawton United	347	1,021	676	—
Glasgow Caradon	840	920	80	—
Gunnislake	2,534	2,399	—	135
Holmbush	32	492	460	—
Levant	710	1,117	407	—
Marke Valley	2,321	2,120	—	201
Mellaneer	6,745	6,697	—	48
New Cook's Kitchen ..	328	469	141	—
Phoenix United	174	205	31	—
Prince of Wales	nil	349	349	—
South Caradon	5,090	5,040	—	50
South Devon United ..	2,162	1,890	—	272
West Caradon	210	281	71	—
West Seton	522	360	—	162
West Tolgus	1,507	1,022	—	485
Wheal Crebor	2,464	2,826	362	—
Wheal Jewell	370	618	248	—

M. W. BAWDEN.

Mining and Assaying Offices, Liskeard, Dec. 29.

ROCK-DRILLS, AND CORNISH MINERS.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—I enclose a press copy of a letter I wrote on the 28th ult. to the Editor of the Cornish Telegraph. I also send you my paper of the 7th inst. in which the letter in a mutilated form appears. Not only has a portion of my letter relating to the automatic feed on the Mont Cenis drills been suppressed, rendering that portion unintelligible, but also in another part the text has been altered, the word "any" being substituted for "my drills," widely altering the sense and conveying a meaning that I did not the least intend, and which I know to be false, giving Mr. Loam a fair ground of complaint. I shall feel myself under an obligation if you will insert in your columns my letter to the Cornish Telegraph exactly as I have written it.—17, York-street, Liverpool, Dec. 9. F. B. DOERING.

TO THE EDITOR OF THE CORNISH TELEGRAPH.

SIR,—My attention has been drawn to an article in your paper of Dec. 31, 1878, on Rock-drills, evidently inspired by Mr. Loam, of Liskeard, and containing damaging statements regarding myself and my drill which have no foundation in fact; and as I understand Messrs. Loam and Son circulate with their *drill prospectus* a copy of this article from your paper, much as I dislike going into print, I am compelled to take notice of it.

You state as follows: "When about 10 years since Mr. Doering introduced his drill into Dolcoath Mine Mr. Loam gave that gentleman his views on the subject. He urged him again and again to discard the automaton and to trust the advance to the men; but Mr. Doering persistently declined to do so, and declared that it was unscientific, although told that the failure of his machine was due to that cause alone."

I beg to state that I have no recollection of having had any conversation with Mr. Loam about the automatic motion of my drills. If this conversation had taken place I would most assuredly have informed him what I now inform you, and I should also have explained to him the nature and mode of action of the advance motion of my drills, which he evidently does not understand, as shown by statements which I note later on.

The first six drills I put to work at Dolcoath Mine were fitted with automatic as well as hand motion, both as regards the turning and the advance of the boring tool, so that if the automatic gear should break down the drills were not rendered useless. The second batch of drills, six in number, were non-automatic in the sense in which I presume you use the word—i.e., that the advance and turning motion could not be actuated by any other means except by hand. This was done to save expense in first cost. Not only can the makers of the drills—Messrs. Simpson and Co., of Pimlico—testify to the accuracy of this statement, but anybody can satisfy themselves by personal inspection of one of these drills which I am informed is still in existence at Dolcoath Mine.

In giving Mr. Loam's views on the Mont Cenis Tunnel drills you state—"But they were all worked with automatic feed, and in this respect all subsequent drills have imitated them. It was thought then by the Italian engineers, and it still seems to be thought by other drill makers to be more certain in its effective action than hand labour; but Mr. Loam soon saw that this was the principal cause of their delays. The rock constantly and suddenly varied in hardness and intersected hard and soft fissures, which necessitated an altered rate of advance, according to the hardness or softness of the rock; but the 'automaton' had a mechanical fixed speed from the piston, and the drill was either driven too fast, or stuck, or was too slow for any useful effect, and all this while the men were looking uselessly and idly on. And yet no one questioned the usefulness of the 'automaton,' nor the cause which, inseparable from all rocks, more or less marred its effects. Mr. Loam gave expression to his opinion upon the matter, but his statement was received with surprise: it was intimated to him that his views were unscientific, and he was told that without such a principle no drill could be worked with precision and effect."

It is difficult to understand how an engineer who had inspected the Mont Cenis drills should display such ignorance of their construction as Mr. Loam does in the above extract from your paper

He is evidently not aware that the automatic advance motion does not act with every stroke of the piston, but only when the piston of the drill makes a forward stroke, exceeding a given defined length, consequently the advance can only occur when the borer has penetrated into the rock far enough to allow of this length being obtained; and as this penetration is absolutely dependent on the nature of the ground, so must also the advance of the drill be dependent on the hardness or softness of rocks, instead of being, as Mr. Loam appears to think, entirely uninfluenced by it.

The above is the governing principle of most automatic feed drills, my own amongst the number. I am much surprised that before circulating such an article Mr. Loam did not take more trouble to inform himself as to the accuracy of the information it contains. It is my firm impression that he has never seen my drills at work under ground; never to my knowledge did he condescend to favour me with a visit underground at Tincroft or Dolcoath; equally retiring was he in his investigation of the mechanism of my drills, and if the examination of the Mont Cenis machines were conducted in a similar manner, it is perhaps not altogether surprising that he should have formed erroneous impressions of their design and action as those set forth in the article he circulates.

It may not be out of place here to make a few statements regarding my drill, how far it succeeded, and wherein lay the defects.

First of all I think I can fairly dispute with the Barrow drill priority of claim to having done good work in Cornwall.

At Tincroft in 1867 the body of mining captains and other gentlemen who accepted Capt. Teague's invitation to inspect the machine and the work it had done were of opinion that it had advanced very much faster than could have been done by hand labour, and at a less cost. At Tincroft no experiment was made; the same machines and carriage were used from first to last. At Dolcoath, however, experiments were being conducted during nearly the whole term of my contract with a view of ascertaining the most suitable form of carriage.

This was a most important element in the drill plant, which I felt was capable of much improvement. The drills themselves, on the other hand, if not altogether perfect, were good working tools, proved by the fact that one of them on the 278 fm. level west in the early part of 1870 worked for a period of 16 weeks two shifts a day without requiring the least repair, or renewal of parts, and when it was brought to surface the machine only required to have the valve packing renewed to be in as good condition for work as ever it was.

Lately a battery of four drills with the requisite air-compressing machinery, constructed by my design by Messrs. Fawcett, Preston, and Co., of Liverpool, for the La Reyna Mining Company, in Spain, have been doing excellent work in the metamorphic slate-rock of the Lower Silurian. They have only been at work three months, scarcely long enough to educate the miners; the weekly advance averages 13 yards. The progress by hand in the same mine before applying the drills did not exceed 10 yards per month. These results I think speak for themselves. I trust that you will give this letter publicity in your columns.

F. B. DÖRING.

York-street, Liverpool, Nov. 28.

VENTILATION AND PURIFICATION OF AIR IN MINES AND COLLIERIES.

SIR,—This is a subject that has engaged the attention of our most eminent colliery engineers and scientific men; and, in the interest of the numerous readers of the *Mining Journal*, a short and graphic description of an invention now being brought under notice may be given, especially as several very satisfactory reports have been obtained respecting its adoption for colliery purposes, and a joint report has been given by Mr. Gallaway, of Cardiff, and Mr. Howard, of Chesterfield, in which it is stated that in dry and dusty mines in which the presence of coal dust forms one of the principal elements of danger, this apparatus might be advantageously introduced at certain points in the workings, in order to create damp localities which, if sufficiently extensive, would effectually arrest the flame of a coal dust explosion. They add that in mines or parts of mines in which black damp or carbonic acid gas is given off by the strata, or produced in any other manner, an apparatus of this kind, either locomotive or stationary, could be advantageously employed for the purpose of absorbing that gas by means of caustic lime placed in the upper tank. The water would absorb a certain proportion of the lime, and in flowing down the tubes or rods it would take up the gas. The lime would thereby be precipitated, and would for the most part collect in the lower tank, from which it could be removed as required. And they consider this apparatus would be more especially applicable in localities where sprinkling water on the floor causes the latter to heave in such a manner as to disarrange the underground railways, and gradually to fill up the roadways and airways, thereby causing much expense for repairs.

The apparatus may be thus described:—For railways and mines it is proposed to fix on a carriage a shallow tank, and above it on pillars or other supports, sufficiently low to freely allow of its passing through the tunnel, another similar tank. Between the two tanks, at a distance of a few inches or so apart, perforated tubes (fluted if necessary) or wire gauze may be placed, which will conduct the water from the upper to the lower tank, which in thus gravitating through the perforated pipes or down the gauze will present to the impure air a thin film of running water. The perforated tubes, which may be made of any known suitable material or gauze, may be covered with flannel or other fabric, which will have the effect of holding the water, and prevent its flying off by the rapid motion of the carriage through the air. To keep a constant supply of water in the upper tank, the inventor fixes one or more centrifugal or other pumps of sufficient capacity to keep the upper tank supplied with water from the lower one; and for this purpose he utilises the motion of the carriage, and works the pumps from a drum fixed to the axle, or in some equivalent manner. If decided, other motive power may be used, such as compressed air, gas, steam, &c. For collecting as much air as possible in passing, wings or lawres may, when desired and where practicable, be hung to the sides or other portion of the carriage. I trust that this invention may at least minimise the number of disastrous colliery explosions which, unfortunately, are of such frequent occurrence, resulting, as they invariably do, in great loss of life and property.

York Buildings, Adelphi, W.C., Dec. 19.

BLASTING WITH WATER CARTRIDGES.

SIR,—Referring to the report of the North Staffordshire Institute of Mining and Mechanical Engineers, in last week's *Journal*, and in which my name appears, in the interests of science and safety mining, in which I have spent years of study, kindly allow me to say that I have written an exhaustive letter to the secretary of the Institute in justification of the action I was compelled to take, purely in self defence, owing to the malicious and unjust attack regarding my unfinished experiments at Leycester, which appeared in the *Staffordshire Sentinel*. I regret the hostile spirit displayed by the few members who were there, where, I repeat, it was arranged with Mr. Settle that I was to experiment the next day with tonite and powder combined to destroy the sparks seen, and for this purpose left my charged water cartridges and satchel containing the tonite in the lamp cabin of the pit, and which Mr. Settle sent for after proposing, at the last moment, his useless and unscientific experiments on the surface in pipes, referred to in my letter to the *Sentinel*, and also printed in your *Journal* of Dec. 9, to which I beg to refer those interested, and also to the report of my successfully finished experiments at Adderley Green Collieries, also in same impression, and to which the report of the above Institute does not refer or even give me credit for having accomplished a complete success with tonite and water cartridges; this, however, may be an omission for which the reporter is responsible, and doubtless will appear in full in their Transactions, having asked the secretary to do this in the interests of science.

I admit—I am anxious for the rigid truth only—that powder could not always be made sparkless and safe in the extraordinary and extremely friable or brittle coal seams of this district, such as I have usually done in my ordinary practice in other coal seams, and consequently had to modify my system for the special requirements of the seams, and finally used small charges of a quick-burning explosive

(tonite) instead of powder, when I obtained absolute safety results. But my difficulty with powder in these friable seams must not be attributed to any defect in the already established safety principles of my system, but to the peculiar inherent nature of the coal operated upon, on the principle that dynamite or tonite is better adapted for blasting certain hard rocks than powder; or, on the other hand, that powder is more suitable for blasting coal than dynamite.

In conclusion, for the guidance of miners and the practical working of water cartridges, I must take exception to Mr. Wm. Heath's theoretical opinions regarding water cartridges tending to create blown-out shots, and that in using them more powder or explosives would require to be used. In actual working practice this is a complete error, for about half the ordinary powder charge is required only, and the water itself acts as an admirable tamping, combined with a tonite charge, to prevent blown-out shots, and already proved beyond dispute, in further proof of which the tamping often remains fixed in the bore-hole mouth, especially when the coal is not very friable or blown about, the soft clay easily fills up the air spaces he refers to, and ordinary care is all that is required to prevent the water cartridge case from damage, which inclines to "sweat" first. However, I have a simple means for this purpose, which entirely meets his objection. Regarding my very first experiments with two non-inflammable cartridges, Mr. Heath is not justified in speaking about, as they were only tried for the purpose of obtaining a knowledge of the chemical proportions necessary in practice, and were of a strictly private character, and well known to Mr. Haines, of these collieries.

I regret to notice that Mr. Hugh Jones's evidence is so contradictory regarding certain facts in practice and his opinions expressed to me.

I will not trespass further on this subject, but shall freely leave you and your interested readers to draw their own conclusions after perusal of the letters and reports I have referred to in justification of my action.—London, Dec. 19.

JAMES MACNAB.

THE METEOROLOGICAL SOCIETY.

The usual monthly meeting of members was held on Dec. 20, at the Institution of Civil Engineers,—Mr. J. K. LAUGHTON, M.A., F.R.A.S., President, in the chair.

Four new Fellows were elected; and Capt. J. de Brito Capello and Mr. W. Ferrel, M.A., were elected honorary members.

The following papers were read:—

1.—"Popular Weather Prognostics," by the Hon. R. Abercomby, F.M.S., and Mr. W. Marriott, F.M.S. The authors explain over one hundred prognostics by showing that they make their appearance in definite positions relative to the areas of high and low atmospheric pressure shown in synoptic charts. The method adopted not only explains many which have not hitherto been accounted for, but enables the failure, as well as the success, of any prognostic to be traced by following the history of the weather of the day on a synoptic chart. The forms discussed are—cyclones, anticyclones, wedge-shaped and straight isobars. The weather in the last two is now described for the first time. They also point out (1) that prognostics will never be superseded for use at sea, and other solitary situations; and (2) that prognostics can be usefully combined with charts in synoptic forecasting, especially in certain classes of showers and thunderstorms, which do not affect the reading of the barometer.

2.—"Report on the Phenological Observations for the year 1882," by the Rev. T. A. Preston, M.A., F.M.S. The most important feature of the phenological year was the mild winter. The effect of this upon vegetation was decidedly favourable; and had it not been for the gales, especially that of April 28, the foliage would have been luxuriant, and therefore free from insect attacks, but the contrary effect has been produced on insect life, for the scarcity of insects, especially butterflies and moths, has been the general remark of entomologists.

Mr. J. S. Dyason, F.R.G.S., exhibited a series of typical clouds in monochrome, and also a series of sketches of clouds made in June, July, and August, 1882.

MINING INSTITUTE OF CORNWALL.

Want of space last week prevented the appearance of more than a review of the contents of the Exhibition of the Mining Institute at Camborne, and the list of the awards, the latter having since been supplemented by bronze medals being conferred upon Messrs. R. S. Newall and Co. and Messrs. Harvey and Co., and high commendations upon Messrs. Selig, Sonnenthal and Co., and Mr. W. Cochran, Durham. The address of the President, Mr. W. Husband, and the excellent papers read by Dr. Hudson and Capt. Josiah Thomas now claim attention.

The PRESIDENT, after referring to the chief exhibits in detail, commented with special force upon the three important topics of steel, electricity, and the Trevithick Memorial. Concerning steel he remarked that its manufacture was one of the most important industries in the world, and simple as it might seem was really a very difficult matter. Some of his hearers might remember when Bessemer patented his system for making steel direct from the ore. The molten cast-iron was run into converters, in which a powerful blast was placed. The blast in passing through the molten iron burnt out of it the carbon and some other impurities, and it was customary to watch the condition of the flame emerging from these converters, and to stop the blast at the right moment. On the Continent that was done, but in this country the system had been in a great measure discarded. It was found very difficult to stop the blowing at the right moment, and so they continued to blow until the carbon had disappeared. The very best iron had to be procured to make the Bessemer steel. The most important enemy to iron was phosphorus. Wherever that existed in undue quantities the iron was not true worth. There was a vast quantity of iron ore in this country which contained a considerable percentage of phosphorus. A process had been invented by which the phosphorus could be removed from the impure iron, and on the Continent many districts have become seats of industry from the fact that phosphorus could be extracted from iron.

The question of electric light versus gas illumination was a very important one, and during the last three or four years there had been more said and written upon it than upon any other scientific subject. A good many had made use of it to frighten the public and cause them to sell their gas shares, but after all the electric light was nowhere. Sir Humphry Davy introduced the electric light, and it was owing to Faraday that they had it in its present form. The whole question between gas and the electric light was one of cost. For dining-rooms, drawing-rooms, churches, chapels, &c., the electric light was excellent. So far, the electric was the light of luxury, and it was difficult to see where the improvement necessary to render it a universal light was to come from or how the price was to be reduced. Another difficulty connected with electric lighting was that you must always have your engine ready to produce the light. Some 18 months ago it was thought that the electricity could be stored, but it was found from experience that one-half the electricity was lost in the process of storing. Considering, therefore, that electricity must be made from hand to mouth, it seemed almost incredible that the electric light could be used on a large scale. Some scientific men said they might convey electricity from long distances very easily, but Dr. Siemens would for the purpose of electric lighting divide a town into districts not larger than a quarter of a square mile. After going very carefully into the whole question, Dr. Siemens came to the conclusion that lighting by the incandescent light would cost rather less than gas, leaving out of consideration the profit the gas companies were making, and gave the opinion that as the lighting of the million gas will retain its present sway, though electricity may be used as an article of luxury. Gas is also being now used for cooking and for gas engines, the latter, when the whole carbon of the coal was converted into gas, which could then be produced for 6d. per thousand cubic feet, being more economical than steam engines.

Concerning the Trevithick Memorial Mr. Husband said:—As we are here to-day on ground very near that on which some of the most celebrated experiments of steam locomotion were tried 80 years ago, I cannot refrain from referring to Trevithick, the Cornish engineer. You have probably seen in the papers able articles on the proposed Trevithick's memorial, and those who are not acquainted

with Trevithick's life I would advise to get his biography, when they will become acquainted with the history of a man who, I believe, never had his equal as an inventor in this country. We do not want to claim too much for Trevithick; we do not want to ignore people who have gone before—the experiments tried by Murdoch on a very small locomotive he made in Redruth nearly 100 years ago. That engine was only a toy, and made in such a way that it never could have become a really valuable locomotive because the boiler was not made on a right form. Here in Camborne Trevithick introduced a locomotive on the common road. Trevithick's carriage was run to and from Tuckingmill, and one day it got into a rut and the whole contrivance was capsized. Trevithick persevered in the use of his locomotive. In 1808 he spent every penny he had building a circular railway, on which ran a locomotive drawing a carriage after it, but he never recovered a farthing. He also gave us our Cornish boiler, which is an honour to the county, which has never been and in principle never can be surpassed. Trevithick, himself, with all his natural ability, is an example to us of what a man may become by the power of genius, and he is at the same time an example of a man where a great deal is lost, and were we did not get the full fruit of the power of his mind from the fact that he was an uneducated man. Trevithick knew less of physical science than the youngest pupil in the Camborne Science Class.

The question had been raised whether Trevithick introduced the blast pipe into the chimney of the locomotive. He did introduce that pipe into the funnels of the locomotives, and on that question he showed the ignorance men were in at that time, for writing a letter from Wales he says: "I have been driving my engine, and I have worked steam up to 147 lbs. the inch, and I am going to work it higher yet, and I send you a piece of the packing to show that it is not burnt up." He goes on to say that by admitting the steam into the chimney and closing the damper, he saw the steam escaping from the funnel, but as soon as he allowed the blast to open into the chimney the steam disappeared, and he supposed it became fixed air. You see in that the importance of introducing scientific teaching amongst the classes in this country. I believe that if Trevithick had been a man of great mathematical attainments he would have stood higher as a philosopher, though he stands first as an inventor, because I believe his mind had entered on all subjects. Invention after invention came from him in quick succession. The dredging machine, the plunger pump, the kibble, were his inventions, and there is hardly anything that on touching it he did not improve its condition. When I see before me gentlemen from all parts of the county connected with mining, and I find that Cornwall has produced such a man as that, and that hitherto we have not had any memorial to his memory, I think you will all feel the time has come when that memorial should be raised, and Cornishmen one and all should have a hand in raising it.

Dr. HUDSON read a paper on "Smoke and Dust in relation to the Health of Miners." More than twenty years had elapsed since Lord Kinnaird's commission enquired into the health of the mining population, and there had been many local investigations, but Dr. Fary, by a mass of figures, settled the question once for all, and convinced the most sceptical. One of his figures showed the effects of the high mortality of Cornish miners on the value of their lives and on the premiums which they would have to pay for the insurance of their lives, as compared with the corresponding value and premiums in the healthy districts of England. Let them take the annual premium to insure 100l. at death:—

Healthy districts.		Cornish mines.	
20 years	£1 7 7	£1 17 6	
30 "	1 15 1	2 11 0	
40 "	2 7 1	3 16 11	
50 "	3 8 3	5 19 8	
55 "	4 4 10	7 6 6	

The Cornish miner suffered very much more from diseases of the lungs than the coal miner, and the excessive death-rate of the Cornish miner might be entirely attributed to these diseases, as, in respect of other diseases, he was more free than the rest of the population. Dr. Hudson presented the following on deaths from lung disease:—

Ages.	Males (England).	Cornish Miners.	Non-Mining Males (Cornwall).
15	3.51	2.92	3.30
25	4.17	3.87	3.83
35	4.17	6.60	4.24
45	4.54	14.98	4.34
55	5.00	17.09	5.19
65 to 75	4.69	9.30	5.48
	26.08	54.76	26.38

The commission found the following conditions to be prejudicial.—Bad ventilation, evidenced by a decrease of oxygen; increase of temperature, increase of carbonic acid, increase of organic matter, increase of carbon in the form of powder and candle smoke, and exhaustion from the climbing of ladders. Dr. Hudson gave a series of excellent diagrams to illustrate his remarks, and went on to examine the development of lung disease and its effect in detail. The large deposit of carbon shown in one of the diagrams was probably one of the inevitable accompaniments of underground work, but it might be lessened in a considerable degree. If the electric light ever became so cheap as to replace tallow candles, with their big smoky wicks, something might be done. Something considerable had been done by the use of nitro-glycerine explosives, as with dynamite and tonite there was not the same atmosphere at all as with powder as an explosive. He well remembered the first mine he descended was one where dynamite was used, and he could go about very readily with the aid of a candle and see a considerable distance. The next mine was one where powder was the explosive employed, and the whole time underground he could scarcely divest himself of the idea that he was in a London fog. Boring machines, with their free discharge of compressed air, also helped to reduce temperature, and to replace a smoky atmosphere, but Capt. Teague's ventilator would be felt certain prove of immense advantage, as it was by means of effective apparatus of this character that the foggy ends would be thoroughly cleared out, and the inhalation of much carbon prevented.

Capt. JOSIAH THOMAS read a paper on underground temperature. He had of late been making some observations on the temperature of Dolcoath Mine, the lower workings of which were in granite, and he thought the results might be interesting, as he was not aware that any experiments had hitherto been made in granite at so great a depth. The experiments of the late Mr. W. Jory Henwood, of Penzance, were for the most part made in the water which issued from the rocks. But this scarcely appeared to be the best method of obtaining the most accurate results, for it was well known the temperature of water was affected by chemical action taking place in the lodes, and by cold surface water passing downwards through the lodes and cross-courses. For the purpose of his observations he had had holes bored 2 ft. deep in dry rock, in which he had inserted one of Negretti and Zambra's slow action mining thermometers to the bottom of the hole. The upper part of the hole was then plugged up with woollen material and covered at the outside with soft clay, so as to exclude all atmosphere. The thermometer was left in the holes for various periods, varying from half an hour to a week. The result of the trials was as follows:—

At the		Temperature of rock.	Temperature of air.
"	12 fathom level	64°	65°
"	40 "	65°	66°
"	125 "	67°	68°
"	170 "	65°	66°
"	302 "	70°	71°
"	352 "	83°	81°

In reference to the lower temperature of the rock at the 170, as compared with the 125, a cold current of air had been passing through the 170, which, no doubt, diminished the heat of the rock to a depth of some feet. The results of his present observations were very different from those that had previously been made in Dolcoath Mine, as recorded by various writers. In 1837 the temperature at Dolcoath at 230 fathoms deep was 75°, and the heat increased 1° for every 51 ft. Although the actual results of various observations, both in Cornwall and in other parts of the world somewhat widely

differed, yet it was a remarkable fact that everywhere, without a single exception, the heat increased as depth was attained. One practical question for them as miners to consider was at what depth their mines could continue to be worked as far as the temperature was concerned. If the temperature continued to increase in the deep mines of this district at the ratio stated by Prof. Everett—1° in 64 ft.—the heat in 150 or 200 fathoms more would be almost unbearable. If it were found on further examination to be only 1° in 98½ ft.—as he had observed it to be in Dolcoath, the temperature in another 100 fms. sinking would be found to be inconveniently warm, and it would become necessary before very long to devise some means for cooling the deep workings and far more effectually ventilating the deepest mines.

PROVINCIAL STOCK AND SHARE MARKETS.

CORNISH MINE SHARE MARKET.—Mr. J. H. REYNOLDS, stock and share broker, Redruth (Dec. 28), writes:—Owing to the Christmas holidays the share market has been very quiet; to-day there is a better demand for Dolcoaths and East Pools at quotations. At East Pool meeting on Monday next a dividend of 27s. 6d. is expected. Subjoined are the closing quotations:—Blue Hills, 1 to 1½; Carn Brea, 8 to 8½; Cook's Kitchen, 3½ to 3¾; Dolcoath, 6¾ to 6½; East Pool, 50½ to 51; East Blue Hills, 7s. 6d. to 10s.; Gunnislake (Clitters) 3½ to 3¾; Killfret, 3½ to 3¾; Mellanear, 4 to 4½; New Cook's Kitchen, 3½ to 3¾; New Kitty, 2½ to 2¾; North Bay, ½ to ¾; Ped-an-drea, 2 to 2½; Phenix, 2½ to 2¾; South Condurrow, 9½ to 9¾; South Crofty, 9½ to 10½; South Frances, 7½ to 8; South Tolarne, 4½ to 5; Tincroft, 6½ to 6¾; Tregembo, 3 to 3½; West Basset, 6 to 6½; West Frances, 7½ to 8½; West Kitty, 12½ to 12¾; West Peavor, 7 to 7½; West Polbreen, ¾ to ¾; West Pollice, 1 to 1½; West Tolgus, 14½ to 16; West Seton, 17 to 19; Wheel Agar, 16½ to 17; Wheel Basset, 8½ to 8¾; Wheel Grenville, 7½ to 8½; Wheel Hony and Trelawny, 2½ to 2¾; Wheel Jane, ¾ to ¾; Wheel Kitty, (St. Agnes), 1½ to 1¾; Wheel Peavor, 4 to 4½; Wheel Prussia, 1 to 1½; Wheel Uny, 4½ to 4¾; Penhalls ¾ to 1; Wheel Coates, ¾ to ¾.

—Mr. S. J. DAVEY, mine sharedealer, Redruth (Dec. 28), writes:—There has been but very little done in our market this week owing to the holidays. To-day East Pools, Dolcoaths, and Killfrets, are a little enquired for. Subjoined are the closing prices:—Blue Hills, ¾ to 1; Carn Brea, 8 to 8½; Cook's Kitchen, 3½ to 3¾; Dolcoath, 6¾ to 6½; East Pool, 50½ to 51; Killfret, 3½ to 3¾; Mellanear, 4 to 4½; New Cook's Kitchen, 3½ to 3¾; New Kitty, 2½ to 2¾; Penhalls, ¾ to ¾; Ped-an-drea, 2 to 2½; Phenix, 2½ to 2¾; South Condurrow, 9½ to 9¾; South Crofty, 9½ to 10½; South Tolarne, 4½ to 5; Tincroft, 6½ to 6¾; Tregembo, 3 to 3½; West Basset, 6 to 6½; West Frances, 7½ to 8½; West Kitty, 12½ to 12¾; West Peavor, 7 to 7½; West Polbreen, ¾ to ¾; West Pollice, 1 to 1½; West Tolgus, 14½ to 16; West Seton, 17 to 19; Wheel Agar, 16½ to 17; Wheel Basset, 8½ to 8¾; Wheel Grenville, 7½ to 8½; Wheel Hony and Trelawny, 2½ to 2¾; Wheel Jane, ¾ to ¾; Wheel Kitty, (St. Agnes), 1½ to 1¾; Wheel Peavor, 4 to 4½; Wheel Prussia, 1 to 1½; Wheel Uny, 4½ to 4¾; Wheel Coates, ¾ to ¾; East Uny, ¾ to 1.

—Messrs. ABBOTT and WICKETT, stock and share brokers, Redruth (Dec. 28), writes:—With the exception of a moderate amount of business in Dolcoaths and East Pools transactions in mining shares have been very quiet. We do not anticipate much life in the market until the holiday season is over. Subjoined are the closing quotations:—Blue Hills, 1 to 1½; Camborne Vean, ¾ to ¾; Carn Brea, 8½ to 8¾; Cook's Kitchen, 3½ to 3¾; Dolcoath, 6¾ to 6½; East Pool, 50½ to 51; East Blue Hills, 7s. 6d. to 10s.; Gunnislake (Clitters), 3½ to 3¾; Killfret, 3½ to 3¾; Mellanear, 4 to 4½; New Cook's Kitchen, 3½ to 3¾; New Kitty, 2½ to 2¾; North Bay, ½ to ¾; Ped-an-drea, 2 to 2½; Phenix, 2½ to 2¾; South Condurrow, 9½ to 9¾; South Crofty, 9½ to 10½; South Frances, 7½ to 8; South Tolarne, 4½ to 5; Tincroft, 6½ to 6¾; Tregembo, 3 to 3½; West Basset, 6 to 6½; West Frances, 7½ to 8½; West Kitty, 12½ to 12¾; West Peavor, 7 to 7½; West Polbreen, ¾ to ¾; West Pollice, 1 to 1½; West Tolgus, 14½ to 16; West Seton, 17 to 19; Wheel Agar, 16½ to 17; Wheel Basset, 8½ to 8¾; Wheel Grenville, 7½ to 8½; Wheel Hony and Trelawny, 2½ to 2¾; Wheel Jane, ¾ to ¾; Wheel Kitty, (St. Agnes), 1½ to 1¾; Wheel Peavor, 4 to 4½; Wheel Prussia, 1 to 1½; Wheel Uny, 4½ to 4¾; Wheel Coates, ¾ to ¾; East Uny, ¾ to 1.

—Mr. M. W. BAILEY, sharedealer (Dec. 28), writes:—The mining market has been almost suspended during the past week, but to-day there is an enquiry for some of the leading mines at present very reduced prices, and no doubt, we shall see a revival in mining as the New Year opens, which is to be hoped will be more remunerative than the closing year. Subjoined are the closing quotations:—Bedford United, 1½ to 1¾; Carn Brea, 8 to 8½; Cook's Kitchen, 3½ to 3¾; Dolcoath, 6½ to 6¾; Devon Consols, 4½ to 4¾; East Caradon, 14 to 14½; East Pool, 50 to 50½; Glasgow Caradon, ¾ to ¾; Gawton United, ¾ to ¾; Gunnislake (Clitters), 3½ to 3¾; Herodsfoot, ¾ to ¾; Hingston Down, ¾ to ¾; Killfret, 3½ to 3¾; Marke Valley, ¾ to ¾; New West Caradon, ¾ to ¾; North Crofty, 9½ to 9¾; Old Gunnislake, ¾ to ¾; Phenix United, 2½ to 2¾; Prince of Wales, ¾ to ¾; South Caradon, 27½ to 28; South Condurrow, 9½ to 10; South Crofty, 9½ to 10½; South Crebore, ¾ to ¾; South Devon United, ¾ to ¾; South Frances, 8 to 8½; Tincroft, 6 to 6½; West Basset, 6 to 6½; West Caradon, 1 to 1½; West Frances, 8 to 8½; West Kitty, 12 to 12½; West Peavor, 7 to 7½; West Phenix, ¾ to ¾; West Seton, 17 to 17½; Wheel Agar, 16½ to 17; Wheel Basset, 8½ to 9; Wheel Crebore, 2½ to 2¾; Wheel Grenville, 7½ to 8; West Tolgus, 17 to 17½; Wheel Hony and Trelawny, 2½ to 2¾; Wheel Kitty, 1½ to 1¾; Wheel Jane, ¾ to ¾; Wheel Peavor, 4 to 4½; Wheel Uny, 4½ to 4¾.

—Mr. JOHN CARTER, mine sharedealer, Camborne (Dec. 28), writes:—In consequence of the holidays there is very little business doing on the share market, quotations in most cases are merely nominal and without particular change to notice. Closing quotations are annexed:—Carn Brea, 8 to 8½; Cook's Kitchen, 3½ to 3¾; Dolcoath, 6¾ to 6½; East Pool, 50½ to 51; Killfret, 3½ to 3¾; New Cook's Kitchen, 3½ to 3¾; New Kitty, 2 to 2½; Mellanear, 4 to 4½; Ped-an-drea, 2 to 2½; South Condurrow, 9½ to 9¾; South Crofty, 10 to 10½; South Frances, 8 to 8½; Tincroft, 6½ to 6¾; West Basset, 6½ to 6¾; West Frances, 7 to 8; West Kitty, 12½ to 12¾; West Peavor, 6½ to 7; West Pollice, 1 to 1½; West Seton, 16½ to 17½; Wheel Agar, 16½ to 16¾; Wheel Basset, 8 to 8½; Wheel Grenville, 7½ to 8; Wheel Kitty, 1½ to 1¾; Wheel Uny, 4½ to 4¾; Wheel Peavor 4 to 4½.

MANCHESTER.—Messrs. JOSEPH R. and W. P. BAINES, share-brokers, Queen's Chambers, Market-street (Dec. 28), write:—The days on which business has been attended to during the past week have been employed either in preparation for or the arrangement of the account, which commenced yesterday. On the whole, though very little has been doing in fresh operations, a steady tone pervades the market, the new year being looked forward to with confidence. What changes in quotations have occurred are in no case of moment, and the alterations are fairly balanced as regards rise and fall in prices, the changes being apparently more the result of individual influences than of any decided general tendency.

BANKS. on the whole, a firm. Manchester and Salford, Manchester Joint-Stock, Liverpool Commercial, and Union Bank of Manchester are all credited with a slight rise. Consolidated show a fractional advance on sellers' figures, whilst Lancashire and Yorkshire exhibit a falling off of ½ on buyers' offers, counter figures in each case remaining unaltered.

INSURANCE. Shares still dull. Commercial Union have rallied ½, and Lancashire ¼, to ¾; these, with a little adjustment of margins in Manchester Fines and Manchester Underwriters, comprise the whole of the movements till to-day, when the former, along with Queens, have declined fractionally. Sea Insurance and British and Foreign Marine are a trifle higher to-day.

COAL, IRON, &c., AND MINING are inactive, and movements irregular.—**COTTON SPINNING.** &c.: Very little doing, and prices telling in buyers' favour.—**TREASURES:** Tons good and rates better where altered.—**TELEPHONES** irregular. Uniteds show an advance of ¼ to ¾, whilst Lancashire and Cheshire are ¼ down.—**CORPORATION STOCKS.** &c.: Several quoted ex div., but otherwise no change to report.—**METALLURGY.** Movements unimportant. Rylands and Sons are ½ up. Hudson's Bay, which up to yesterday after fluctuations showed a rise of ½, has receded, and on balance are now ½ down. Household Stores further declined ¼.

RAILWAYS.—The Christmas holidays have interfered with business, but since "carrying over" yesterday a firmer tone has prevailed. Brighton, A's have not shared in the improvement, marking a decline of 1½ on reported issue of a million new capital. Canadians have shown some strength to-day on the Grand Trunk total traffic, but the best prices are not maintained. Americans have fallen slightly, but beyond a little attention being given to the New York, Pennsylvania, and Ohio Election there is no feature.

SCOTCH MINING AND INDUSTRIAL COMPANIES SHARE MARKETS.

STIRLING.—Mr. J. GRANT MACLEAN, sharebroker and ironbroker (Dec. 28), writes:—During the past week markets have been quiet, and the tendency is favourable owing to the satisfactory reports of business. In the Scottish pig-iron market the price of warrants, after advancing to 50s. 3d., has quickly relapsed to 48s. 7d., owing to a large failure. The prospects, however, are favourable, as the home trade continues active, and the labour question is not exciting much attention, while the new American tariff is likely to cause an extended business with that country. The yearly returns of trade are also very favourable. The production shows a decrease of about 50,000 tons, or 4½ per cent., while the stocks have decreased fully 100,000 tons, due to the large increase of home consumption and exports, the quantity imported from England being much smaller. Chapel House Colliery are 10s. to 15s.; Maydy Iron, 18s. 9d. to 21s. 3d.

In shares of copper concerns prices are inclined to improve. Tharsis has advanced from 36½ to 37½; Bratsberg from 35s. to 40s.; Corporation of South Australia, 7s. to 10s.; Mason and Barry, 16½ to 17; Rio Tinto, 23 to 23½; Bentein, 7s. 6d. to 12s. 6d.; Souback and Catil Alan, 15s. to 17s. 6d.; Tocopilla, 10s. to 15s.

In shares of home mines, business remains quiet, owing to the holiday influence. Bickton Silver-Lead offered. At the sale of the Glasgow Caradon Company on the 21st inst. (170 tons) realised 84½, 17s. 6d., or an average of 55s. 19d. per ton. While last month 170 tons were sold at an average of 115s. 4d. per ton; there was no sale last December, but in November 110 tons only realised 72s. 3d. In the December months of previous years the sales ranged from 160 to 260 tons, and the prices realised from 72s. to 112s. 7d. For this year to date the total sales show an increase of 90 tons and 1592. Caron are at 2s. 6d. to 3s. 9d.; Carn Camborne, 20s. 6d. to 17s. 6d.; Carnarvon, 5s. to 7s. 6d.; Carnarvonshire Great Consols, 12s. 6d. to 17s. 6d.; Devon Friendship, 6s. to 9s.; East Devon Consols, 20s. to 25s.; East Roman Consols, 2s. 6d. to 5s.; Glenroy, 5s. to 7s. 6d.; Great Pibgooth United, 3s. to 5s.; Gobbett, 10s. to 15s.; Gwydyr, 5s. to 7s. 6d.; Herodsfoot, 3s. 9d. to 6s. 3d.; Llandegla, par; Mulberry Tin, 32s. 6d.; Mounts Bays, 11s. 3d. to 13s. 9d.; Old Shepherds, 18s. 9d. to 21s. 3d.; Parka, 5s. to 7s. 6d.; Penhalls, 15s. to 20s.; Parys, 7s. to 8s.; Pely Wood, 3s. 6d. to 5s.; Prince of Wales, 10s. to 12s. 6d.; Stridrig, 5s. to 7s. 6d.;

South Crebore, 2s. 6d. to 5s.; South D'Eresby, 6s.; Tamar, 15s. to 20s.; Tin Hills, 6s.; Tankerville, 5s. to 6s.; West Wye Valley, 3s. 9d.; West Phenix, 7s. 6d. to 10s.; Wheel George, 7s. 6d. to 12s. 6d.; Wheel Jane, 15s. to 20s.

In shares of gold and silver mines prices are generally easier. Richmonds, 7½; Akankoo are at 8s. 9d. to 11s. 3d.; Central Wynad, 5s. to 10s.; California, 13s. 9d. to 21s. 3d.; Chile Debutentes, 9s. to 100; Eureka (Nevada), 3s.; Flagstaffs, 3s. 9d. to 5s.; Gold Coast, 17s. 6d. to 22s. 6d.; Guinea Coast Gold, 10s. to 15s.; Indian Consolidated, 6s. 3d. to 7s. 6d.; Indian Westworth, 5s. to 10s.; Kohinoor, 20s. to 25s.; New Gold Run, 3s. 6d.; ditto (preference), 4s. 6d.; Nava de Jairaque, 2s. 6d. to 3s. 9d.; Simons Reef, 2s.; and Silver Peak, 1s. 3d. to 2s. 6d.

In shares of oil and miscellaneous companies prices are steady. Lawes' Chemicals, 5½ to 5½; Nobel's Explosives, 29½. Uphall Oil shares have improved from 9½ to 10.

EDINBURGH.—Messrs. THOMAS MILLER and SONS, stock and share brokers, Princes-street (Dec. 27), write:—Business has been very quiet during the past week. There are no changes worth mentioning in railway ordinary stocks. Canadians stand at much the same price as those of last week. In Americans, New York, Pennsylvania, and Ohio, first bonds, have declined from 51½ to 50½; Erie from 40½ to 40½; Ontario from 27½ to 27; Readings from 28½ to 27½. In banks, Bank of Scotland has advanced from 31½ to 31½; National from 31½ to 30½ ex dividend; Royal from 21½ to 21½. Clydesdale has receded from 24½ to 24½; Commercial from 57½ to 55½ ex dividend. Tharsis Sulphur and Copper have risen from 37 to 37½; Marbella Iron Ore from 5½ to 6; Midlothian Oil from 9½ to 10; Clippen's Oil from 13 to 13½. Young's Paraffin has receded from 13½ to 13½; Burntisland Oil from 15½ to 15½. American Lumber shares have receded from 7 to 6½; British Canadian Lumber from 12 to 11½.

IRISH MINING AND MISCELLANEOUS COMPANIES SHARE MARKET.

CORK.—Messrs. J. H. CARROLL and SONS, stock and share brokers, South Mail (Dec. 27) write:—Markets were very quiet to-day, and prices were more or less nominal, at the same time the tone was very firm, and Great Southern were bought at 11½. Midlands remain at 89½, and Bandon 88. National Banks changed hands at 24½ to 24½, and Munsters were bought at 7. Nothing done in Provincials or Hibernians. Cork Steam Packets were firm at 11, on favourable dividend, and Gas Shares were enquired for at 6½. Gouldings were also in demand at 9, and Leveys at 5½. Lyons shares remain 5½, and Debutentes were enquired for at 100½.

Registration of New Companies.

The following joint-stock companies have been duly registered—

SQUIRE, FOX, AND COMPANY (LIMITED).—Capital 40,000£, in shares of 1£. The manufacture and sale of patent medicines, compounds, and preparations. The subscribers (who take one share each) are—E. G. Elm, Vauxhall; J. B. Martin, Victoria Mansions; S. G. B. Wollaston, St. Mary Cray; A. H. E. Spong, 41, Oxford Mansions; S. H. Hartley, 39, Berwick-street; H. Betson, 6, Abchurch-yard; H. E. Winter, 30, Palace-street.

THE CHEKARITE COMPANY (LIMITED).—Capital 8000£, in shares of 5£. To acquire, use, or otherwise dispose of patents for the manufacture of insulated compounds, &c. The subscribers are—J. M. Walker, 9, Old Broad-street, 100; H. M. Hyndmans, 10, Devonshire-street, 1; C. S. Dawson, 40, Wigmore-street, 1; R. E. Gower, 8, Hanover-square, 1; G. Adams, 16, Bishopsgate-street Within, 1; L. Mayes, Palmerston-buildings, 1; J. C. McLaren, Oriental Club, 1.

THE PENDLETON PROPERTY COMPANY (LIMITED).—Capital 20,000£, in shares of 50£. The business of a land and building company in all branches. The subscribers are—J. Grundy, Pendleton, 10; S. Statham, Pendleton, 10; J. H. Hardcastle, Pendleton, 10; T. Bowes, Pendleton, 3; W. Slater, Pendleton, 10; S. Bradshaw, Pendleton, 6; W. Bailey, Eccles, 10.

JOHN BRYD AND COMPANY (LIMITED).—Capital 30,000£, in shares of 100£. To acquire and continue a business of horsehair merchants and manufacturers, established at Castle Cary, Somerset. The subscribers are—J. Bryd, Castle Cary, 100; J. S. Bryd, Castle Cary, 25; W. Macmillan, Castle Cary, 20; C. P. Coombs, Castle Cary, 1; F. Whitelock, Castle Cary, 8; J. Mackie, Castle Cary, 2; W. Cruse, Ansdorf, 1.

THE BLAIRTIT AND BAYONNE IMPROVEMENTS COMPANY (LIMITED).—Capital 250,000£, in shares of 10£. To carry on all or any of the usual businesses of a land and building company. The subscribers (who take one share each) are—H. O. Lewis, 1, Lancaster Gate, A. K. Mackinnon, 1, Gloucester-street, S. Smirke, 10, Haymarket, A. Smirke, 94, Piccadilly, E. H. Langston, 60, Haymarket, F. W. Mackie, 1, Upper Bedford-place, A. Ricardo, 11, Angel Court.

THE CENTRAL SINGLE MEN'S LODGINGS COMPANY (LIMITED).—Capital 10,000£, in shares of 5£. To acquire certain leasehold premises in Swan-alley, and convert same into working men's lodgings. The subscribers (who take one share each) are—W. J. Harris, 3, St. John's-street, W. Gorwill, 20, Holloway-road, J. F. Thompson, 32, Addington-square, G. C. Goodman, Hornsey, A. E. King, 9, King-street, E. Healey, 51, Threadneedle-street, C. Goodman, 51, Threadneedle-street.

THE WHEEL PROSPER COMPANY (LIMITED).—Capital 15,000£, in shares of 5£. To acquire by purchase or otherwise certain mining property rights and belongings situated in the parish of Lanivet, Cornwall, commonly known as the Wheel Prosper Tin Works. To mine, win, work, quarry, raise, and prepare for sale and deal in any metal ore and metallic minerals, and any other earth or mineral substances, stone, fire-clay, &c., obtainable from the mines or property held by the company, and otherwise to carry on the business of a mining company in all branches. The subscribers (who take one share each) are—E. H. Bainbridge, New Wandsworth, gentleman; H. G. Brown, Leytonstone, accountant; D. McCallum, 34, Romilly-road, clerk; D. W. Englebert, Sydenham, clerk; H. Robson, Campden Hill, gentleman; W. J. Smith, Abchurch Chambers, solicitor; F. A. Smith, Lee, gentleman. The subscribers will appoint the first directors, the members of whom must not be less than three or more than five. The qualification for future directors is fixed at 150 shares.

THE SEFTON IRONWORKS AND GENERAL ENGINEERING COMPANY (LIMITED).—Capital 50,000£, in shares of 1£. To acquire certain ironworks in Liverpool, and carry on the business in connection therewith. The subscribers are—F. R. Ellis, Sefton Ironworks, 100; R. W. Hopkins, Manchester, 10; A. S. Leech, Manchester, 10; W. Byers, Manchester, 10; W. H. F. Brookes, Openshaw, 10; W. Muir, Hulme, 1; S. Bracegirdle, Manchester, 5.

THE ENGLISH PHOSPHATE ASSOCIATION (LIMITED).—Capital 40,000£, in shares of 10£. To purchase, develop, and work a property situated in the departments of Lot and Tarn et Garonne, France. The subscribers (who take one share each) are—E. S. Houlder, 146, Leadenhall-street; E. Cayford, 146, Leadenhall-street; G. Robson, 38, Gutter-lane; F. G. Wilton, Caylus, 16, Walker, Leeds; G. H. Sergeant, Bradford; C. F. Hartridge, 14, Leadenhall-street; J. G. Landon, 38, Gutter-lane; G. Shrimpton, 14, Leadenhall-street; F. Kaye, Woodford.

THE MIDLAND PATENT BRICK AND COAL COMPANY (LIMITED).—Capital 15,000£, in shares of 5£. To acquire, develop, and work a property situated in the parish of Whittington, Chesterfield. The subscribers are—B. B. Allen, Shepherd's Bush, 5; J. W. Mears, 38, Southampton Buildings, 10; E. Payne, 23, Southampton-street, 5; W. C. Howe, 3, Featherstone Buildings, 10; E. Harrison, 17, Fenchurch-street, 10; L. A. Menden, 8, Levington-street, 5.

THE BRITISH ALIZARINE COMPANY (LIMITED).—Capital 200,000£, in shares of 10£. The business of makers and sellers of alizarine, anthraquinone, and other colouring matter suitable for dyeing and printing. The subscribers are—A. Wylie, Glasgow, 750; H. Brock, Glasgow, 1800; J. Pierre, Glasgow, 100; J. Higgenbotham, Glasgow, 200; W. Henderson, Glasgow, 500; T. Reed, Glasgow, 100; A. O. Ewing, Bonhill, 2100; C. J. Higgenbotham, Glasgow, 200.

THE ENGLISH, FOREIGN, AND COLONIAL PATENT CABLE TRAMWAY COMPANY (LIMITED).—Capital 251,000£, in shares of 1£. To purchase, sell, or otherwise dispose of patents relating to the construction of tramways or railways to be worked by cable traction. The subscribers (who take one share each) are—C. Lempiere, Oxford; H. R. Stewart, 12, Regent-street; H. W. Shaw, Romford; G. Hayes, 4, Cowley-street; C. S. Dawson, 25, Emperor's Gate; G. Ball, Hampstead; R. W. Davidge, 7, Westminster Chambers.

JOHN BAYLEY AND SONS (LIMITED).—Capital 120,000£, in shares

of 10£. To purchase the Persian (Cotton) Mills at Bolton, and continue the business connected therewith. The subscribers are—C. H. Bayley, Broughton Park, 50; S. H. Swire, Ashton-under-Lyne, 50; G. F. Bayley, Southport, 50; E. T. Wray, Ashton Bridge, 50; G. A. Bell, Beechwood, 50; T. H. Arrasmith, Eccles, 10; J. Cheetham, Bolton, 50.

THE SETTLED LAND IMPROVEMENT COMPANY (LIMITED).—Capital 50,000£, in shares of 5£. To make advances to landowners for the improvement, &c., of their properties. The subscribers (who take one share each) are—A. W. Beveridge, 18, Abingdon-street; J. V. Haggart, Edinburgh; W. L. Purves, 20, Stratford-place; W. T. Armour, Edinburgh; J. L. Hamilton, Edinburgh; J. Alland, Edinburgh; A. P. Purves, Edinburgh.

"BOYS" PUBLIC DAY SCHOOL COMPANY (LIMITED).—Capital 50,000£, in shares of 5£. To establish and maintain schools for higher education than that given at the board schools, in various parts of England and Wales. The subscribers are—J. H. Rigg, 130, Horseferry-road, 10; G. W. Bate, Battersea, 5; H. Leers, 12, Kensington Gardens-square, 10; S. C. Buxton, 15, Eaton-place, 10; W. Campbell, 30, Westbourne Park, 5; S. Kemp, Streatham, 5; W. H. Stone, Godalming, 20.

STEAMSHIP INVERALT COMPANY (LIMITED).—Capital 21,000£, in shares of 100£. The purchase, owning, and working of said steamship. The subscribers (who take one share each) are—L. Stoddart, Liverpool; A. Stoddart, Liverpool; W. B. Bowling, Liverpool; A. Barnsley, Liverpool; J. F. Cay, Liverpool; A. Shute, Liverpool; J. H. Edwards, Liverpool.

MARPLE BRIDGE LOAN AND DISCOUNT COMPANY (LIMITED).—Capital 5000£, in shares of 5£. Lending money, discounting bills, promissory notes, &c. The subscribers are—J. Platt, Ludworth, 20; J. Pevendon, Ludworth, 5; J. B. Thornley, Ludworth, 5; A. Thornley, Ludworth, 5; F. Hinchcliffe, Ludworth, 5; B. H. Encroft, Ludworth, 10.

ANGLO-INDIAN TEA COMPANY (LIMITED).—Capital 100,000£, in shares of 2£. To acquire a property belonging to the West Hoptown Tea Company, and carry on the business connected therewith. The subscribers (who take one share each) are—C. Macbeth, 113, Gray's Inn-road; A. Ross, 18, Bennett's Hill; W. Francis, Haggerston; W. G. Colebeck, 18, Bennett's Hill; C. G. Cutler, 18, St. Benet's Hill; J. Pearson, 7, West Kensington-terrace; E. A. Nelson, Thames Ditton.

BIRMINGHAM WESTERN DISTRICTS TRAMWAYS COMPANY (LIMITED).—Capital 100,000£, in shares of 10£. To construct, equip, maintain, and work tramways in Warwickshire. The subscribers (who take one share each) are—W. H. Dawes, Bromwich; H. Wheeler, Oldbury; W. Stableford, Oldbury; R. Williams, Wednesbury; E. A. Bayliss, Old Jewry; H. T. McNeal, 8, Elm Park Gardens; W. A. Pope, Bolton Gardens; W. L. Holt, 1, Pelham-place; R. Pearce, 1, Church-court.

THE UNITED TELEPHONE COMPANY OF THE RIVER PLATE (LIMITED).—Capital 200,000£, in shares of 5£. To carry on in the Argentine Republic or elsewhere the business of a telephone and telegraph company in all branches. The subscribers are—A. Wood, Godstone, 20; R. W. Cunningham, 114, Earl's Court-road, 20; C. E. Blogg, 43, Alvington-crescent, 1; E. Cliffe, 53, Upham Park-road, 1; H. W. Grace, Loughton, 1; T. W. Bishop, 4, Great Winchester-street, 1; J. H. Dodgson, 4, Great Winchester-street, 1.

CWM DWYFOR AND BRYNARIAN MINES (LIMITED).—Capital 20,000£, in shares of 1£. To acquire of the Cwm Dwyfor Mining Company, (Limited)—in liquidation—the interest of that company in the mines and minerals, except slate and slate-rocks, in part of the firm of Blaen-y-zennant, in the county of Carnarvon, and other mines and minerals situate in the county of Cardigan, together with all other property and assets of such company. The working of all or any of said mines, lands, and mining properties, obtaining the ores, treating and operating upon same, and generally conducting all operations incidental to a mining company. The subscribers (who take one share each) are—C. Barton, Wincanton, J.P.; L. Logan, Hull, clerk in Holy Orders; F. Bellair, St. Clement's House, no occupation; F. B. Henderson, St. Clement's House, C.E.; E. Brooks, 85, Gracechurch-street, accountant; J. Maw, Stratford, cement manufacturer; J. Stewart, Sutton, merchant. The following gentlemen compose the first board—Messrs. Barton, Logan, Maw, and Stewart. Qualification is fixed at 200 shares.

HALLIDIE PATENT CABLE TRAMWAYS CORPORATION (LIMITED).—Capital 1,000,000£, in shares of 10£. To construct, equip, maintain, and work tramways and railways in the United Kingdom and the Isle of Man. The subscribers (who take 100 shares each) are—A. Arnold, Halifax; Sir J. B. Stewart, Bart., Ballygawby Park; J. B. Martin, Victoria Mansions; E. H. Byas, 25, Belsley Park; J. Rock, Tunbridge; J. C. Wakefield, 25, Holland Villas-road; J. Clenninson, 7, Westminster Chambers.

THE LOUGHBOROUGH AND CHARNWOOD FOREST COAL COMPANY (LIMITED).—Capital 2000£, in shares of 5£. The business of colliery proprietors, coke manufacturers, miners, and dealers in coal, coke, and fuel of any description. To purchase or otherwise acquire any coal pits, coke or fuel manufactory, or any lands, buildings, works, &c., and to sell, let, or otherwise dispose of same. The subscribers (who take 20 shares each) are—C. S. Wheelwright, Loughborough; C. Wilson, Loughborough; C. William, Southfield; W. Brooks, Loughborough; J. Hack, Loughborough; D. Moore, Loughborough; F. Moss, Loughborough; J. Jones, Loughborough; F. Haynes, Loughborough; H. North, Loughborough.

THE HALIFAX SUGAR REFINING COMPANY (LIMITED).—Capital 125,000£, in shares of 5£. To carry on a business of sugar manufacturers and refiners on the Dartmouth side of Halifax Harbour in Nova Scotia. The subscribers (who take one share each) are—J. C. Fraser, Liverpool; A. Chapman, Liverpool; J. E. D. Ryder, Liverpool; P. Simpson, Liverpool; J. Tilley, Manchester; F. North, Liverpool; W. Blackburn, Liverpool.

THE ST. LEONARDS-ON-SEA GRAND HOTEL COMPANY (LIMITED).—Capital 20,000£, in shares of 10£. The acquisition and maintenance of one or more hotels, hereditaments, &c. The subscribers are—W. F. Revill, Hastings, 10; J. Reeves, Hastings, 10; F. Richards, St. Leonards-on-the-Sea, 10; G. C. Hope, Hastings, 10; C. Reinmann, Hastings, 10; T. R. Harden, Hastings, 5; F. J. Parsons, Hastings, 10; J. R. Richards, Hastings, 10; J. Reeves, Hastings, 10.

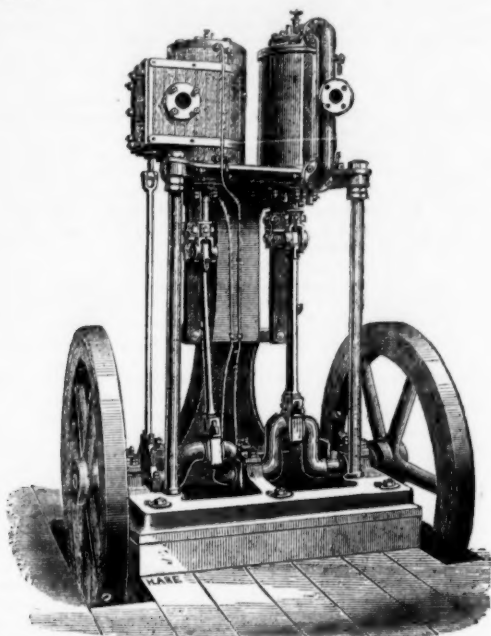
THE KENILWORTH WATER COMPANY (LIMITED).—Capital 10,000£, in shares of 5£. To supply the parish of Kenilworth, in Warwickshire, with pure water, and to carry on the usual business of a water company. The subscribers (who take one share each) are—T. Floyd, 3, Victoria Mansions; W. Hunt, Croydon; G. Lowtham, 17, Great Charles-square; C. M. Elborough, 51, Queen Victoria-street; A. Cass, 46, Maude-grove; E. Dean, 51, Queen Victoria-street; A. M. Shaw, 51, Queen Victoria-street.

LONDON AND SILVERTON MINING COMPANY (LIMITED).—Capital 60,000£, in shares of 1£. The acquisition of mining and mineral properties in the United States, and particularly the lands, minerals, and mining rights known as the Belcher Mine, situate near Silverton county of San Juan, State of Colorado. To develop and work this or any other property, or any mines, beds, quarries, or substances which may be found under any lands in the possession of the company, and generally to carry on all operations incidental to a mining company. The subscribers (who take one share each) are—T. K. Weir, Gresham House, metal broker; T. V. Anthony, Gresham House, metal broker; J. J. Grisson, 208, Victoria Park-road, clerk; R. S. Archold, 9, New Broad-street, merchant; P. Penn Gaskell, Junior Carlton Club, J.P.; J. M. Carey, 9, New Broad-street, clerk; G. T. Verney, 9, New Broad-street, clerk. The board includes the following gentlemen: Messrs. T. K. Weir, P. Penn Gaskell, J. A. Weir, K. H. James, J. G. Seacombe, and J. R. W. Henry. The number must not be less than three or more than seven.

SOUTHERN BRAZILIAN RIO GRANDE DO SUL RAILWAY COMPANY (LIMITED).—Capital 600,000£, in shares of 20£. To construct, equip, maintain, and work a railway in that Empire. The subscribers (who take one share each) are—P. L. Mahoir, Paris; M. Lyon, Paris; D. Z. F. S. Banderai, Paris; M. C. F. Geoffroy, Paris; R. E. Lawrence, Blackheath; W. A. Simpson, Bartholomew House; E. Chaplin, Bartholomew House; W. Chamberlain, 72, Herne Hill-road.

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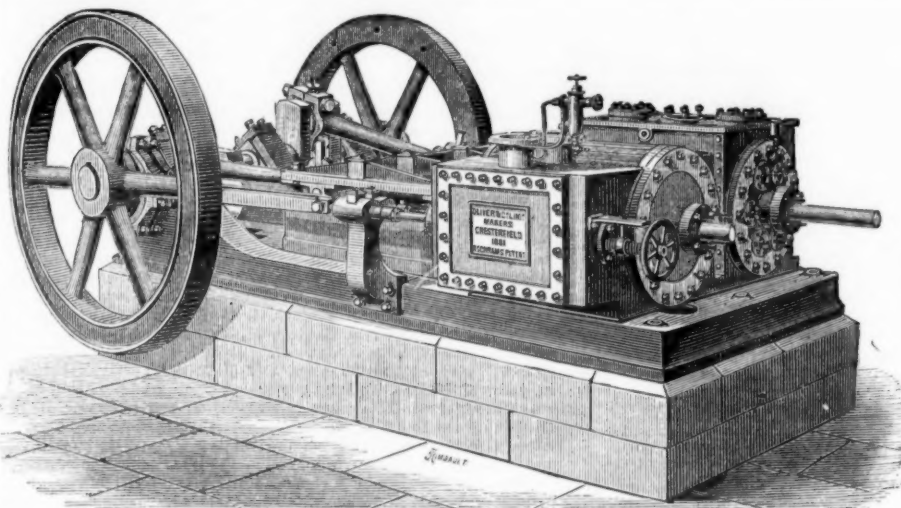
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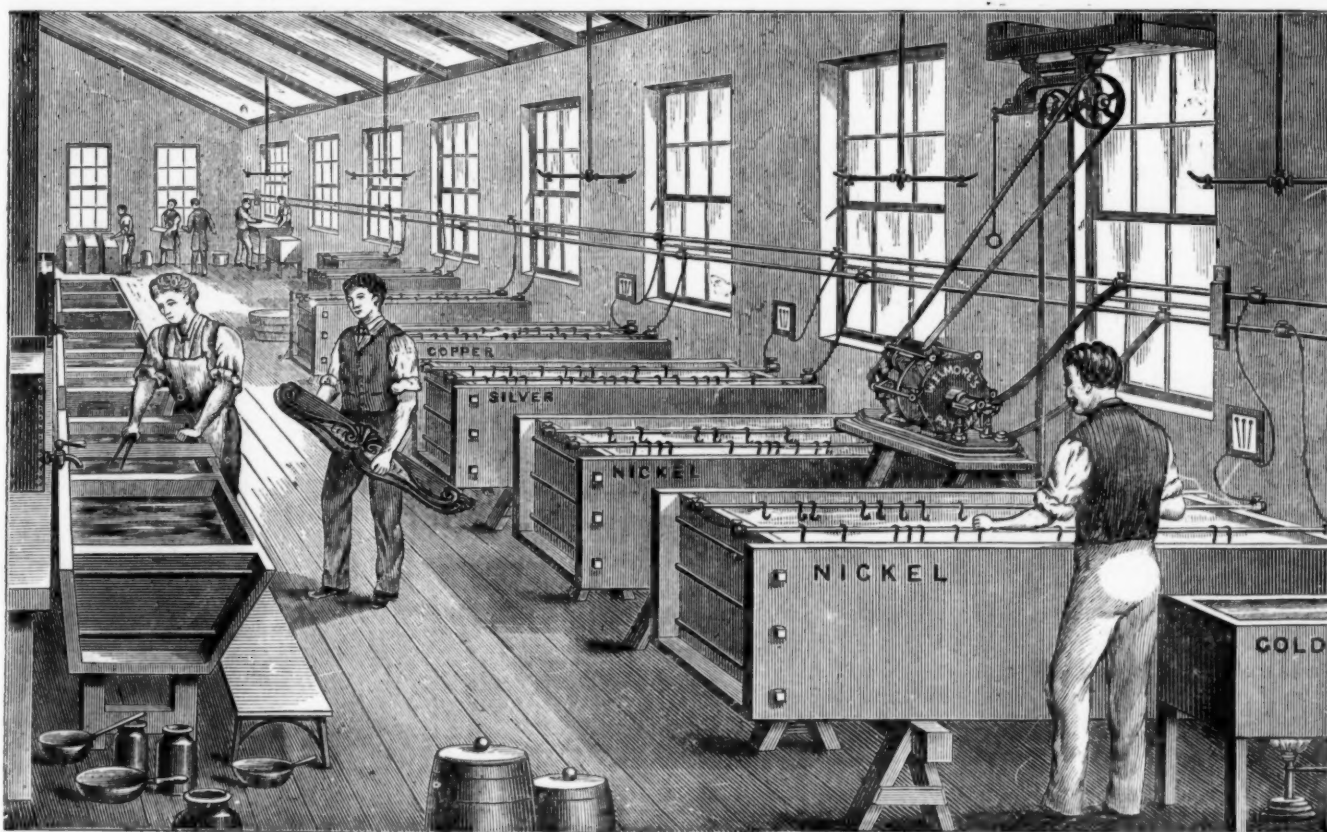
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“Mr. ELMORE has just received two pieces of ordnance from Her Majesty’s Works at Chatham, with an order to nickel-plate the same, together with the carriages upon which they are mounted. Mr. Elmore has done similar work for the Government on previous occasions, and it will be remembered that the screw propellers used on the torpedo boats were nickel-plated by him. The “Elmore” Dynamo-Electric Machines and complete electro-plating outfits have been supplied to Government Departments at home and abroad.”

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ART METAL DEPOSITING WORKS,
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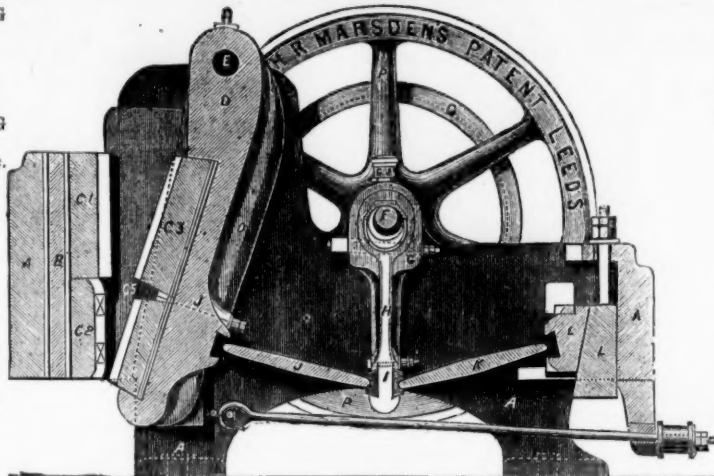
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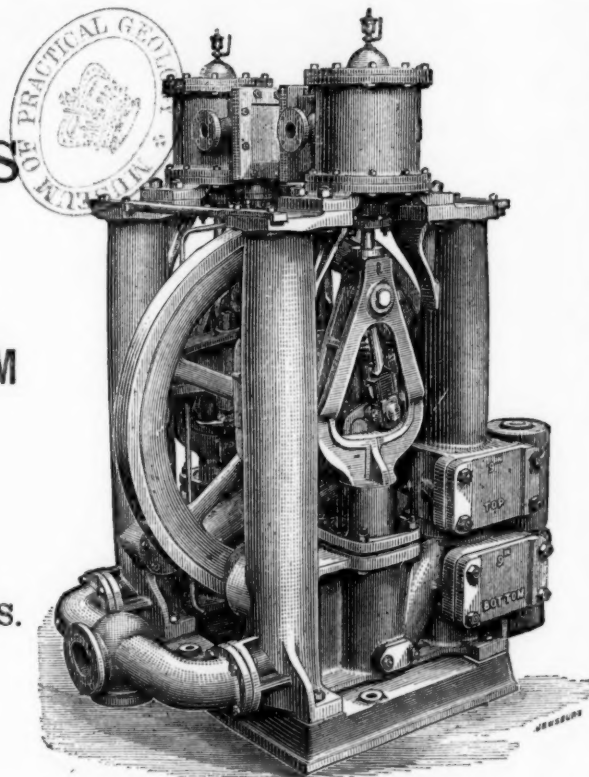
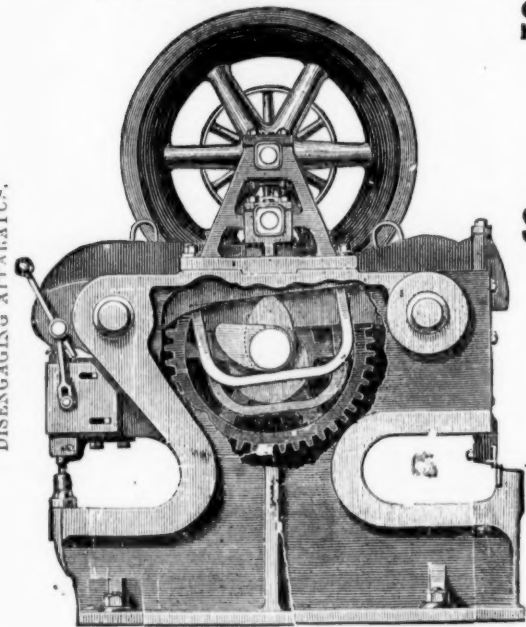
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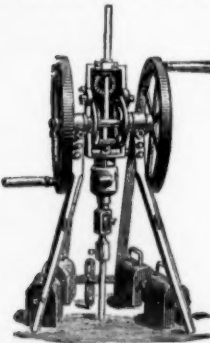
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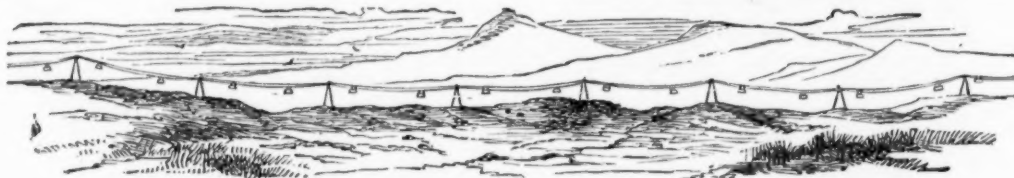
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